

## Position Summary

This summary describes the organization, duties, and requirements of a State of Michigan vacancy.

**Position Code:** TRNSTCHEA22R

**Civil Service Class and Level:** TRANSPORTATION TECHNICIAN-E

**Working Title (What the agency calls the position):** Construction Technician

**Name and Position Code Description of Direct Supervisor:** MCANDREW, KENTON C; ENGINEER MANAGER LICENSED-3

**Department/Agency:** TRANSPORTATION CENTRAL OFFICE

**Bureau (Institution, Board, or Commission):** Highway Operations

**Division:** Southwest Region

**Section:** Construction

**Unit:** Coloma Business Office

**Work Location (City and Address)/Hours of Work:** 3880 Red Arrow Hwy, Benton Harbor, MI 49022 / 7:00 a.m. - 3:30 p.m. Mon-Fri (hours may vary)

**General Summary of Function/Purpose of Position:** This position participates in and oversees the following: Construction and quality control inspection activities designed to ensure that highways, bridges, and allied transportation facilities are constructed to the plans and specifications contained in contractual construction agreements. Reviews and documents project records for adherence to standards. Performs engineering technical support activities, including materials testing, inspection, and compliance. Ensures right-of-way permit activities are performed and are completed consistently within standards and specifications. Designs technical and/or automated drafting activities in such specialized areas as engineering, electrical, right-of-way, cartography, or architecture for the purpose of laying out and preparing drawings of new or existing facilities, roadways, bridges, property and maps. Traffic technical activities designed to enhance highway safety and user efficiency through the collection, analysis, and application of traffic and highway safety data and principles to specific traffic control, signing, signaling and marking situations. Performs surveying technical work of a variety of surveying activities that provides assistance in the surveying of roads, building sites, bridges, environmental sites, and determination of land boundaries under the guidance of a professional surveyor.

This position is required to possess a valid driver's license to perform field inspections and reviews.

### Assigned duties and tasks for each duty.

**Duty 1:** Performs construction and quality control inspection activities designed to ensure that highways, bridges, and allied transportation facilities are constructed to the plans and specifications contained in contractual construction agreements. This duty requires possession of a valid driver's license to perform field inspections and reviews.

- Performs concrete testing such as air content and slump, inspection on such construction items as culverts, sewers and drainage structures, base or surface course, guardrail placement, bridges, sodding and seeding, erosion control, and pavement patching.
- Monitors/inspects construction projects to maintain contract compliance.
- Performs various tests on concrete or bituminous paving materials to assure quality control specifications are met.
- Confers with personnel employed by contractors, public utilities, city/county engineering departments, or consultants regarding coordination of construction project activities.
- Performs office technician work such as reviewing/completing daily reports, plans, proposals, specifications, construction manuals, and contract documents; setting up, reducing and checking field books; plotting cross sections; computing areas/volumes; preparing field books and sketches for land clearings; setting up/maintaining engineering file systems; making contractor's payments.
- Documents construction progress/activities in computerized record keeping programs by maintaining detailed project records and preparing periodic reports on project progress, including materials used, and test results.
- Inspects construction projects ensuring work is completed per specification, including sampling and testing materials to be used, ensuring proper certification of materials, maintaining records, preparing daily reports and project progress reports, informing supervisor of problems. Inspects phases of bridge, grading and paving projects assigned; prepare written inspection reports and records.
- Inspects soil erosion and sedimentation control devices.
- Performs wage rate interviews on contractor's employees.
- Trains seasonal and other employees.

**Duty 2:** Performs engineering technical support activities, including materials testing, inspection, and compliance. Ensures material acceptance activities are within standards and specifications. Ensures right-of-way permit activities are performed and are completed consistently within the Transportation Service Center (TSC), Region, and Statewide.

This duty requires possession of a valid driver's license to perform field inspections and reviews.

- Reads, interprets, or explains applicable standards, technical literature, regulations, plans, and specifications.
- Completes necessary paperwork for material inspection and compliance.
- Performs aggregate gradation testing, density testing, and concrete testing.
- Performs Independent Assurance Testing relating to all testing on federal aid projects.
- Performs laboratory and/or field tests and sampling on materials proposed for construction to determine compliance with specifications.
- Reviews and documents project records for adherence to standards.
- Performs data collection, analysis, tabulation, and application of engineering data within specific work situations.
- Performs field reviews of permit applications for encroachment; writes and issues permits and inspects permit work.
- Reviews and processes permit applications from state agencies, private businesses, and the general public to construct within the highway right-of-way; including the identifying of adverse effects of proposed construction and preparing written responses to applicants. Coordinates details leading to the issuance or denial of construction and utility permits.
- Understands and interprets the specifications and special provisions for materials used on state and local government jobs to ensure compliance.
- Evaluates soils for road and foundation and makes recommendations to project engineers.
- Prepares engineering drawings, charts, maps, specifications, legal descriptions, cost estimates, noncompliance notices, and relocation permits.
- Performs mathematical calculations.
- Organizes and keeps track of permits issued using computers and required programs.
- Trains seasonal and other employees.

**Duty 3:** Performs design technical and/or automated drafting activities in such specialized areas as engineering, electrical, right-of-way, cartography, or architecture for the purpose of laying out and preparing drawings of new or existing facilities, roadways, bridges, property and maps.

- Draws architectural and engineering details of roadways, buildings, structures, topographical features and more using computer generated techniques and programs.
- Prepares charts and graphs for the presentation of statistical data.
- Operates Global Position System (GPS) and Electronic Distance Meter (EDM) equipment to take and check measurements.
- Computes and verifies mathematical data, and plots the same for surveys, construction centerlines, ties and alignment data.
- Checks plotted and computed data and updates, and corrects drawings and computations.
- Prepares charts and graphs for the presentation of statistical data.
- Maintains sets of drawings, test reports, work changes, vouchers, and daily reports for projects. Maintain files.
- Prepares special provisions, supplemental specifications, and special details.
- Prepares plans and sketches of roadways, right-of-ways, buildings, structures, utilities, equipment and equipment adaptations and office layouts.
- Details grades, geometrics, drainage, utilities and structures, and computes necessary dimensions.
- Plots and displays physical, cultural and geographic features. Delineates boundaries according to legal description, date, means of acquisition, restrictions, sales of excess and other miscellaneous data. Creates freehand sketching, lettering, pencil layouts, and ink work on engineering charts and graphs.
- Determines materials necessary to meet planning criteria and coordinates the work and changes with the construction staff and others as necessary.
- Trains seasonal and other employees.

**Duty 4:** Performs traffic technical activities designed to enhance highway safety and user efficiency through the collection, analysis, and application of traffic and highway safety data and principles to specific traffic control, signing, signaling and marking situations.

This duty requires possession of a valid driver's license to perform field inspections and reviews.

- Prepares traffic plans for construction projects, including plans for both construction and permanent signs and markings.
- Conducts field investigations on problem locations, takes measurements, traffic counts, and makes recommendations.
- Reviews traffic control set-ups for safety and compliance.
- Develops and reviews traffic management plans and performs traffic work zone reviews during construction.
- Maintains and reviews data as it relates to roadway maintenance activities.
- Recommends and draws up sample changes in standards and specifications for geometric design guides, signs and signals.
- Prepares quality sheets, authorizations and cost estimates for roadway improvements and sign or signal projects.
- Calculates span loading, heights, timing cycles and electrical energy usage on electrical signal projects.
- Prepares layouts for geometric modifications to meet operational and safety requirements.
- Prepares detailed designs, drawings, or strip maps for roadway improvements and control devices.
- Recommends and prepares possible design treatments and placement of control devices.
- Performs on-site field investigations to determine the adequacy of signing and pavement marking.
- Conducts field reviews to ensure conformance to guidelines and proper installation of signing, as well as inspections during and after installation.
- Prepares computer inventory of existing and proposed signing data, quantities, and field engineering for sign upgrading contracts.
- Develops and evaluates emergency detour routes in coordination with other offices and stakeholder agencies.
- Assists in the development, field work, administration and evaluation of pavement marking and signing contracts, and contracted services.
- Reviews construction plans in terms of traffic operations, construction signing, geometric design, final signing, signals, pavement marking and reflective system.
- Reviews maintenance of traffic plans, including field reviews with design and construction staff, and make recommendations.

**Duty 5:** Performs surveying technical work of a variety of surveying activities that provide assistance in the surveying of roads, building sites, bridges, environmental sites, and determination of land boundaries under the guidance of a professional surveyor.

- Performs a variety of survey work assignments including stacking rods, setting prisms for measurements, running rods for benches and cross section elevations, searching for section corners, property irons and survey points, and cutting brush for lines.
- Records measurements and descriptive data in various forms and formats.
- Performs calculations and computations. Participates in laying out grids and determining horizontal and vertical controls.
- Analyzes and compares computations with standards set forth by state law or department policy.
- Documents survey findings and delineation of lines and boundaries as found and set, using drawings, sketches, and inked tracings.
- Prepares topographic and contour maps of land surveyed. Measures distances in both metric and English units.
- Sets and witnesses stakes, monuments, iron pins, spikes, nails with tags for the establishment of horizontal and vertical control. Sets monuments under the direction of a licensed land surveyor.
- Operates precise and automatic digital automatic levels, electronic total stations and robotic total stations with data collectors, and GPS receivers.
- Uses an electronic data collector to record survey data. Records field data in field book using legible writing and directly into computer input forms.
- Maintains and cleans survey instruments, tools and vehicles.
- Trains seasonal and other employees.

**Duty 6:** Participates in educational advancement, career development, and advanced training.

- Attends training courses and conferences.
- All other duties as assigned by supervisor.

**Types of decisions made independently and whom or what those decisions affect:** Routine, non-complex technical decisions necessary to carry out the mission of the department.

**Types of decisions that require the supervisor's review:** When there is a deviation from an established procedure or when new situations arise which have not been dealt with before.

**Physical effort used to perform this job and environmental conditions of this position:** Outdoor work in all types of weather; work around dirt, concrete, bituminous materials; work around construction structures and excavations and construction equipment. Position may require availability outside normal working hours based on operational needs. Requires the ability to work in confined spaces, traverse all types of terrain and various highway and bridge structures. Work hazards include working on roadways in traffic, working with chemicals, and wearing personal protective equipment. Requires ability to travel to meetings and seminars. Overnight stays may be required. The ability to transport items weighing up to 50 lbs. This position is required to possess a valid driver's license.

**Names and classes and levels of employees whom this position immediately supervises:**

**The essential functions of this position:** This position participates in and oversees the following: Construction and quality control inspection activities designed to ensure that highways, bridges, and allied transportation facilities are constructed to the plans and specifications contained in contractual construction agreements. Reviews and documents project records for adherence to standards. Performs engineering technical support activities, including materials testing, inspection, and compliance. Ensures right-of-way permit activities are performed and are completed consistently within standards and specifications. Designs technical and/or automated drafting activities in such specialized areas as engineering, electrical, right-of-way, cartography, or architecture for the purpose of laying out and preparing drawings of new or existing facilities, roadways, bridges, property and maps. Traffic technical activities designed to enhance highway safety and user efficiency through the collection, analysis, and application of traffic and highway safety data and principles to specific traffic control, signing, signaling and marking situations. Performs surveying technical work of a variety of surveying activities that provide assistance in the surveying of roads, building sites, bridges, environmental sites, and determination of land boundaries under the guidance of a professional surveyor.

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**The function of the position's work area and how it fits into that function:** Provides customer service to the public, local and contract agencies, and vendors. This includes coordinating construction projects, designing road and bridge projects, developing maintaining traffic plans, issuing permits and evaluating and inspecting bridges and culverts. This position performs basic, intermediate, and/or experienced level work in right of way/design development, inspection, surveying, and office work on highway and bridge program and projects, and associated transportation functions.

**Minimum education, experience, and credentials typically needed to perform the position's essential functions:**

**EDUCATION:**

Possession of an Associate's degree in concrete technology, civil technology, construction technology, surveying technology, construction management, mathematics, or computer science.

**EXPERIENCE:**

**Transportation Technician 8**

No specific type or amount is required.

**Transportation Technician 9**

One year of experience equivalent to a Transportation Technician 8.

**Transportation Technician E10**

Two years of experience equivalent to a Transportation Technician, including one year equivalent to a Transportation Technician 9.

**Alternate Education and Experience**

**Transportation Technician 8 - 12**

Possession of a Bachelor's degree or higher in an Applied Science or Science with 16 semester hours (24 term) credits in job specific or related course work qualifies for the Transportation Technician E10 level.

OR

Completion of 60 semester (90 term) credits including 24 semester (36 term) credits in any combination of course work in the following areas: structures, materials, soils, hydrology, surveying, design, drafting, bituminous, concrete, aggregate, chemistry, physics, geology, environmental science, computer science, highway or traffic technology, construction management, engineering, or mathematics may be substituted for the associate's degree.

OR

Four years of technician level experience consisting of quality control inspections, drafting, materials and testing, surveying, or traffic may be substituted for the Associate's degree.

OR

Current certification in bituminous (hot mix), concrete, density testing, or aggregate gradation and one year of technician level field experience may be substituted for the associate's degree.

OR

Current certification in bituminous (hot mix), concrete, density testing, or aggregate gradation and three years experience equivalent to a Transportation Maintenance Worker 9 may be substituted for the associate's degree.

OR

Current certification in bituminous (hot mix), concrete, density testing, or aggregate gradation and two years experience equivalent to an Engineering Assistant may be substituted for the associate's degree.

OR

Current certification in bituminous (hot mix), concrete, density testing, or aggregate gradation and completion of 16 semester (24 term) credits in any combination of course work in the following areas: structures, materials, soils, hydrology, surveying, design, drafting, bituminous, concrete, aggregate, chemistry, physics, geology, environmental science, computer science, highway or traffic technology, construction management, engineering, or mathematics may be substituted for the Associate's degree.

#### **KNOWLEDGE, SKILLS, AND ABILITIES:**

Knowledge of:

- Mathematics.
- The proper use of equipment.
- Department safety policies and procedures.
- Computer input forms & proper formatting of data.
- Computer programs.
- English/metric conversion factors.

Ability to:

- Use testing equipment.
- Calculate areas/volumes.
- Communicate with others effectively.
- Maintain favorable public relations.
- Conduct tests in the field.
- Read/interpret design/construction plans/specifications.
- Understand/carry out detailed technical instructions.
- Read/interpret design/construction plans/specifications.

#### **CERTIFICATES, LICENSES, REGISTRATIONS:**

Possession of a valid driver's license is required.

Possession of the following within 12 months of the date of hire into the position and must maintain throughout employment in the position:

- Comprehensive Soil Erosion and Sedimentation Control (SESC) certification.
- Construction Storm Water Operator (CSWO) certification.
- 1 of 4 industry certifications (aggregate, density, bituminous, or concrete).