**State of Michigan**
**Civil Service Commission**

Capitol Commons Center, P.O. Box 30002
Lansing, MI 48909

| **Position Code** |
| --- |
| 1. TRAENGAC94R |

# POSITION DESCRIPTION

This position description serves as the official classification document of record for this position. Please complete the information as accurately as you can as the position description is used to determine the proper classification of the position.

| | |
| --- | --- |
| **2. Employee's Name (Last, First, M.I.)** | **8. Department/Agency**<br>TRANSPORTATION CENTRAL OFFICE |
| **3. Employee Identification Number** | **9. Bureau (Institution, Board, or Commission)**<br>Bridges and Structures |
| **4. Civil Service Position Code Description**<br>TRANSPORTATION ENGINEER-A | **10. Division**<br>Structure Design |
| **5. Working Title (What the agency calls the position)**<br>Senior Level Bridge Design Engineer | **11. Section** |
| **6. Name and Position Code Description of Direct Supervisor**<br>NADJARIAN, JOHN V; ENGINEER MANAGER LICENSED-3 | **12. Unit**<br>Bridge Design |
| **7. Name and Position Code Description of Second Level Supervisor**<br>WAGNER, BRADLEY; STATE ADMINISTRATIVE MANAGER-1 | **13. Work Location (City and Address)/Hours of Work**<br>425 W. Ottawa Street, Lansing, MI 48909 / 7:30a–4:30p (hrs may vary at mgmt discretion) |

**14. General Summary of Function/Purpose of Position**

A senior level engineer responsible for the preparation of the design of the most complex and unique design projects assigned to the design unit. Various types of unique and most complex design projects include: superstructure replacement design, multi-span bridge widenings, and complex construction staging. This position prepares special provisions, design exceptions, cost estimates and other project related documents. This position has the ability to efficiently respond to and resolve design related construction issues.

**15. Please describe the assigned duties, percent of time spent performing each duty, and what is done to complete each duty.**

**List the duties from most important to least important. The total percentage of all duties performed must equal 100 percent.**

**Duty 1**

**General Summary:** **Percentage: 80**

Senior Engineer responsible for design of the most complex and unique design projects assigned to the design unit. Various types of unique and most complex design projects include: superstructure replacement design, multi-span bridge widenings, and complex construction staging. This position prepares special provisions, design exceptions, cost estimates, and other project related documents.

**Individual tasks related to the duty:**

- Performs the more complex and unusual design projects including superstructure replacements, multi-span bridge widenings; accelerated design schedules; innovative design techniques; and complex construction staging.
    - For accelerated design schedules, this would include for the total replacement of the bridge, develop a comprehensive and innovative reinforcement detail spreadsheet to create the reinforcement details and auto check the result for accuracy.
    - For superstructure replacements, this would include skewed bridges using combinations of engineering, hand calculations, refined methods of analysis, and computer programs. Designs and checks portions of structure to remain in place for appropriate loads and different applicable design standards; evaluates and determines the feasibility of various superstructures for the capacity of the existing substructure units; and determines logical retrofits in addition to temporary measures required for constructability.
- For multi-span bridge widenings, perform the complete designs for multi-span complex bridge widenings utilizing multiple computer design runs, hand calculations, and/or use of stand-alone programs for different components of the structures.
- Complex construction staging including developing staging plans for all types of projects including complex construction staging and prepares construction staging sequence, notes, and/or critical path for multi-task/multi-bridge projects. For example, construction staging that includes three or more stage construction.
- Prepares cost comparisons of alternative bridge design studies and prepares engineer estimates for programming.
- Accesses programs utilizing engineering workstation and computer.
- Performs fracture critical design and analysis which includes the ability to design/analyze a load path redundancy that allows the structure to redistribute load to other structure members on the structure if any one member loses capacity. This task includes designing for part-width construction on fracture critical structures.
- Designs using emerging technology materials and methods. Having the working knowledge of different design techniques and material that will help in the design and improve constructability of projects that may be more difficult or impossible to do. For example: self-consolidating concrete; micro composite reinforcement; stainless steel – clad reinforcement.
- Assists in keeping unit records, estimating man-hour requirements, setting dates for completing phases of work, and preparing status of plans. Advises the unit supervisor on the progress being made to assure compliance with production schedules.
- Prepares proposal materials for contract bidding.
- Checks final plans for accuracy and completeness.
- Designs and develops plans to minimize utility impacts. This includes developing alternate designs and complex details to accommodate or avoid utilities such as re-designing footings to gap out a large utility pipe or similar utility conflicts.
- Prepares design exceptions. Having the ability to recognize the need and gather necessary information in order to prepare complete design exceptions, as well as compare correctly existing and proposed conditions to the requirements of American Association of State Highway and Transportation Officials (AASHTO) and other relevant standards.
- Recognizes the need for a special provision and gathers technical and other information in order to write the special provisions and submits for review and approval.
- Ability to efficiently respond to and resolve design related construction issues, such as the need for significant changes in foundation, superstructure, or other elements of the bridge.
- Assists in the review of journey engineer's bridge plans.

**Duty 2**

**General Summary:** **Percentage: 15**

Serve as subject matter expert for state-wide alignment for complex and unique structure design.

**Individual tasks related to the duty:**

- Coordinates and conducts liaison activities at the direction of the supervisor with private industry, consultant firms, etc., to obtain input for design and preparation of final plans.

- Schedules and attends meetings such as, scope verification, utility, plan review, and Omissions and Errors Check (OEC) to give and receive input. Implement recommendations into final plans.
- Incorporates special design methods and plans out of a design schedule that accelerates the design schedule.
- Incorporates innovate design techniques into MDOT projects. Researches new methods used nationwide for pre-cast members and other accelerated bridge construction and develops or adapts new details, specifications, and designs (for precast members and other accelerated construction methods) .For example: designer performs design for converting simple span steel structures to continuous for live load structures.

**Duty 3**

**General Summary:** **Percentage:** **5**

Performs related work as assigned by unit leader.

**Individual tasks related to the duty:**

- Participates in seminars, training courses, and other learning activities.
- Other duties as assigned.

**16. Describe the types of decisions made independently in this position and tell who or what is affected by those decisions.**

Make proper applications of design theory. Provide solutions to unexpected design problems occurring during construction.

**17. Describe the types of decisions that require the supervisor's review.**

When accepted policies or procedures are not applicable to current design requirements. When conflicting instructions vary from sources.

**18. What kind of physical effort is used to perform this job? What environmental conditions in this position physically exposed to on the job? Indicate the amount of time and intensity of each activity and condition. Refer to instructions.**

Work involves normal physical effort to sit, walk, or stand at will; exposure to dirt, fumes, heavy and high-speed traffic, or adverse weather conditions; bending, stooping, and reaching for plans; carrying heavy or bulky loads; sitting for long periods of time in front of a computer; overtime; and heavy workloads working with specific deadlines. Must be able to communicate both orally and in writing. Occasional field reviews of proposed or active road/bridge construction projects requires walking over irregular terrain. Must have corrected vision to read plans or perform field related duties. Valid driver's license is required.

**19. List the names and position code descriptions of each classified employee whom this position immediately supervises or oversees on a full-time, on-going basis.**

**Additional Subordinates**

**20. This position's responsibilities for the above-listed employees includes the following (check as many as apply):**

| | | | |
|---|---|---|---|
| N | Complete and sign service ratings. | N | Assign work. |
| N | Provide formal written counseling. | N | Approve work. |
| N | Approve leave requests. | Y | Review work. |
| N | Approve time and attendance. | Y | Provide guidance on work methods. |
| N | Orally reprimand. | Y | Train employees in the work. |

**22. Do you agree with the responses for items 1 through 20? If not, which items do you disagree with and why?**

Yes.

**23. What are the essential functions of this position?**

A senior level engineer responsible for the preparation of the design of the most complex and unique design projects assigned to the design unit. Various types of unique and most complex design projects include: superstructure replacement design; multi-span bridge widenings; and complex construction staging. This position prepares special provisions, design exceptions, cost estimates and other project related documents. This position has ability to efficiently respond to and resolve design related construction issues.

**24. Indicate specifically how the position's duties and responsibilities have changed since the position was last reviewed.**

**25. What is the function of the work area and how does this position fit into that function?**

Preparation of plans and contract documents for the construction and rehabilitation of highway structures of all classifications. A senior level Engineer performs design of bridges of various complexity and prepare complete design plans and contract documents for project letting.

**26. What are the minimum education and experience qualifications needed to perform the essential functions of this position.**

**EDUCATION:**

Possession of a bachelor of science degree in engineering.

Possession of a bachelor of science degree in civil engineering is preferred.

**EXPERIENCE:**

**Transportation Engineer 12**
Three years of professional engineering experience involved in transportation systems and programs equivalent to a Transportation Engineer, including one year equivalent to a Transportation Engineer P11.

**Alternate Education and Experience**

**Transportation Engineer 9 - 12**
Possession of a registered professional engineer license as required by the State of Michigan may be substituted for 6 months of experience at the Transportation Engineer 9-12 levels. This substitution may only be used once for any employee for qualification of appointment or early reclassification.

**KNOWLEDGE, SKILLS, AND ABILITIES:**

Must have extensive knowledge of MDOT and Federal Highway Administration specifications and a working knowledge of the specifications used to determine if any or all geometric issues are to standard. Extensive knowledge of the principles and practices of transportation engineering. Extensive knowledge of state, federal, and local laws related to the work. Extensive knowledge of engineering office practices. Ability to communicate effectively both written and orally. Extensive knowledge of engineering principles and practices applied in bridge design including design guide standards and specifications. Capability to make independent decisions.

**CERTIFICATES, LICENSES, REGISTRATIONS:**

Possession of a valid driver's license.

***NOTE: Civil Service approval does not constitute agreement with or acceptance of the desired qualifications of this position.***

***I certify that the information presented in this position description provides a complete and accurate depiction of the duties and responsibilities assigned to this position.***

**Supervisor** **Date**

**TO BE FILLED OUT BY APPOINTING AUTHORITY**

**Indicate any exceptions or additions to the statements of employee or supervisors.**

None.

***I certify that the entries on these pages are accurate and complete.***

| KELSEA COLE | 9/1/2021 |
|---|---|
| **Appointing Authority** | **Date** |

***I certify that the information presented in this position description provides a complete and accurate depiction of the duties and responsibilities assigned to this position.***

| | |
|---|---|
| **Employee** | **Date** |