

**STATE OF MONTANA
MONTANA DEPARTMENT OF TRANSPORTATION
JOB PROFILE AND EVALUATION**

SECTION I - Identification

Working Title:

Civil Engineer Specialist I

CE Career Ladder entry level

Class Code Number: 172515

Department:

Transportation

Division & Bureau:

Engineering Division

Class Code Title:

Civil Engineer Specialist

Section & Unit:

Missoula District

Pay Band: 5

Work Address:

2100 West Broadway

Missoula, MT 59802

Position Number: Various

Phone: 406-523-5805

FLSA Exempt

FLSA Non-Exempt

Profile Completed By:

Russ McDonald

Human Resources Division Administrator

Work Phone:

406-444-6044

Jennifer Jensen

Human Resources Specialist

406-444-6041

Brian Cameron

CMS, LLC

406-442-4934

Work Unit Mission Statement or Functional Description:

The MDT's mission is to serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality and sensitivity to the environment.

The Highways and Engineering Division prepares projects for bidding and coordinates highway construction. The Division is made up of the Materials, Construction, Right-of-Way, Bridge, Traffic and Safety, Environmental Services, Engineering Oversight, and Preconstruction bureaus; the CADD Systems and Engineering Management Support sections; and five District Construction Offices in Missoula, Butte, Great Falls, Glendive, and Billings for budget and workforce purposes. Each District oversees highway and bridge construction from the time a construction contract is awarded to a private contractor until the project is completed and approved. During highway construction projects, District personnel work closely with the contractor, conducting construction surveys, inspecting the work, and monitoring traffic control.

Describe the Job's Overall Purpose:

This position serves as an entry-level civil engineer within the assigned District and is responsible for conducting and coordinating engineering analyses of various project components, overseeing design processes, and providing consultation and technical assistance on construction projects to ensure compliance with engineering standards, Department requirements, and contract specifications. The position reports to the designated Engineering Project Manager and provides leadworker supervision to engineering project aides and/or other technical and support staff within the District.

SECTION II - Major Duties or Responsibilities

% of Time

A. ENGINEERING ANALYSIS

40%

1. Plans inspections (e.g., grading inspection, fill inspection, paving inspection, aggregate surface testing, etc.) of highway construction projects to ensure compliance of contractors with engineering standards and specifications. Determines applicable specifications and standards based on type of project; identifies deviations from plans and specifications and areas of non-compliance; notifies contractor of non-compliance issues; and provides explanations of project requirements and recommendations to achieve compliance.
2. Verifies that materials samples for each project are collected and tested to ensure compliance with standards set forth by AASHTO, MDT Materials Manual, and engineering standards and specifications. Obtains necessary samples for each project and reviews standard specifications to determine minimum guidelines for materials inspections (e.g., tolerances, thicknesses, density, acceptable test ranges, etc.); conducts or directs testing to ensure compliance with all minimum requirements; and provides recommendations to achieve compliance.
3. Performs engineering analyses of preliminary design plans to identify errors or inconsistencies in calculations, measurements, etc.; ensure feasibility of proposed designs; and identify necessary changes to plans based on existing site conditions and engineering standards. Coordinates with designers to recommend and justify modifications and revise design plans.
4. Analyzes and evaluates field survey and site investigation data to determine the preliminary layout and engineering requirements of planned and active construction sites. This includes engineering, cost, and risk analyses associated with various options and alternatives.
5. Compiles and prepares inspection documentation and various reports to clearly articulate results of construction inspections, surveys, and other engineering activities and studies. Provides engineering decisions and judgments, ensures that critical issues and features identified in the inspections or studies are included in documentation, and recommends solutions to remedy issues of non-compliance and engineering/design conflicts.
6. Develops and analyzes projected engineering project costs to establish contract estimates that reflect market trends, resource availability, and the best interests of the Department. This involves calculating total quantities of required materials; monitoring bid price trends and recommending appropriate unit prices; ensuring the logic and defensibility of cost estimates developed by other staff and contractors; and determining design modifications that maximize functions of various structures while minimizing project costs.

7. Calculates, documents, and verifies contractor quantities and specifications to determine appropriate contractor payment. Maintains and reviews field notes to verify quantities and specifications, examines project progress, performs and verifies various calculations (e.g., dirt quantities, volumes, materials used, etc.), and uses engineering judgment to estimate correct payment based on materials and project status.

B. ENGINEERING DESIGN

40%

1. Analyzes and evaluates designs developed by other MDT personnel. Determines, explains, and justifies engineering modifications as necessary to ensure the overall quality, safety, compliance, and cost-effectiveness of preliminary designs.
2. Participates in pre-construction meetings, plan-in-hand meetings, and field reviews for preliminary and final designs to provide recommendations for design modifications to ensure compliance of proposed construction with engineering standards and specifications and to ensure feasibility of project based on site features and conditions.
3. Recommends necessary adjustments in the field to planned designs to fit field conditions while maintaining compliance with project specifications and construction standards. Performs various engineering calculations as required to determine appropriate modifications to designs, identifies other aspects of plans that may be affected by proposed changes, and develops solutions to anticipated impacts.
4. Conducts or reviews preliminary surveys of proposed project sites and completes final editing of surveys to provide designers with information for incorporation into construction designs. Gathers data related to existing ground features (e.g., topographical points, hydrological features, etc.), surveys using data collector and/or GPS, establishes traverse control, performs corner searches, cross-sections roadway, and sets control points for slope-staking, approach-staking, etc. Calculates grade changes, elevation, etc. to determine staking locations and construction limits.
5. Conducts or directs pre-construction and construction surveys and layout of projects by reviewing and evaluating design plans to correlate design plans to sites, and to indicate construction limits for contractor. Establishes horizontal and vertical controls for roadways and structures, calculates volumes, and conducts or oversees staking and layout of drainage, grading, and other features based on analysis of design plans.
6. Resolves engineering and design problems encountered by field project staff. The position is required to assess in-progress problems and develop viable solutions according to sound engineering principles and standards, Department requirements, project timelines, and resource availability.

C. CONSULTATION AND TECHNICAL ASSISTANCE

10%

1. Provides engineering consultation and guidance to other engineering and design personnel throughout the course of projects. This includes interpreting and explaining advanced technical aspects of designs; analyzing, evaluating, and resolving engineering problems encountered in the field; and providing quality assurance reviews.

2. Provides specialized engineering assistance to District engineers involved with road design, materials, traffic, and other areas to ensure appropriate evaluation and incorporation of various engineering-related issues and considerations in construction and maintenance projects.
3. Checks plans submitted by others for accuracy, feasibility, and compliance with current design standards. Verifies calculations and distances and ensures plans are clear, concise, and accurate.

D. LEADWORKER SUPERVISION 05%

1. Provides leadworker supervision to subordinates by reviewing and revising work plans, priorities, and procedures for engineering project aides and/or other technical and support staff. Monitors progress through meetings, review and consultations.
2. Plans and assigns work of subordinate staff according to the individual job descriptions, project needs, abilities, and interests. Interprets, monitors, and implements work plans, policies, and procedures. Reviews assigned work for compliance with quality, quantity, and engineering standards. Assists subordinates in solving complex aspects of work assignments.
3. Determines and fulfills training needs of organizationally subordinate staff and provides ongoing guidance and technical assistance as necessary.
4. Oversees the work of engineering project aides regarding specialized program functions, operations, and procedures. Ensures compliance of subordinate staff with all applicable engineering standards and specifications.

E. OTHER DUTIES 05%

This position performs a variety of other duties as assigned by supervisors in support of the Department mission and District objectives. This includes exchanging information with contractors, agency staff, and the public; providing training, education, and professional and technical assistance; coordinating special projects; participating in ongoing training and educational programs; and performing a variety of other duties as directed.

2. *Specific examples of problems solved, decisions made, or procedures followed when performing the most frequent duties of this position include:*

Problems and decisions relate to planning and overseeing construction project operations and activities to ensure compliance with engineering standards and contract specifications. The position assesses and approves contractor performance and project delivery for payment, including partial payments, incentives, and disincentives. The position also provides consultation and technical assistance to field project staff to resolve engineering/design conflicts, contract deficiencies, and other problems.

3. *The most complicated aspect of this position is:*

The most complex aspect of the position involves the analysis of multiple engineering and design components relative to professional standards, Department requirements, and contract specifications to ensure safe, efficient, and cost-effective project designs and delivery.

4. *Guidelines, manuals, or written procedures that support this position include:*

Available guidelines, manuals, and written procedures include District project plans and objectives; State, federal, AASHTO, and FHWA standards; project specifications; Montana

Materials Manual, Montana Construction Manual, and Standard Specifications for Road and Bridge Design; engineering standards; and applicable environmental rules and regulations.

5. ***Which of the duties and/or specific tasks listed under 1. (above) are considered “essential functions” that must be performed by this position (with or without accommodations)? (If you need information or training on the identification of essential functions, please contact MDT Human Resources Division.)***

The following duties are considered essential functions because they require specialized expertise and skill and are the primary reasons the job exists:

Duty A: Engineering Analysis

Duty B: Engineering Design

Duty C: Consultation and Technical Assistance

The following mental and physical demands are associated with these essential functions:

PHYSICAL

- Lifting objects weighing up to 50 lbs.
- Ability to walk over uneven terrain or in water
- Continual walking and/or standing
- Extensive travel within the state to project locations (1,000+ miles/month).
- Operating a personal computer
- Communicate in writing, in person, and over the phone

MENTAL

- Deal with the public on a regular basis
- Ability to multi-task
- Demands for accuracy in all aspects of work
- Ability to meet inflexible deadlines
- Decision making that affects public health and safety
- Computing arithmetic operations
- Comparing data
- Compiling information
- Analyzing
- Coordinating
- Synthesizing
- Negotiating
- Instructing

Field work involves working conditions associated with an active construction site, including:

- Exposure to extreme weather
- Exposure to loud noises
- Exposure to high-temperature substances
- Exposure to high-speed traffic

6. **Does this position supervise others?** Yes No

Number directly supervised: Various

Complexity level of the positions supervised: Various

Position Number(s) of those supervised:

7. **This position is responsible for:**

- | | | | |
|---|---------------------------------|---|-------------------------------------|
| <input type="checkbox"/> Hiring | <input type="checkbox"/> Firing | <input checked="" type="checkbox"/> Supervision | <input type="checkbox"/> Pay Level |
| <input type="checkbox"/> Performance Management | | <input type="checkbox"/> Promotions | <input type="checkbox"/> Discipline |
| <input type="checkbox"/> Other: | | | |

8. **Attach an Organizational Chart.**

ATTACHED

SECTION III - Minimum Qualifications - List minimum requirements for the first day of work.

Critical knowledge and skills required for this position:

KNOWLEDGE:

This position requires knowledge of the principles and practices of civil engineering technology and related advanced mathematics and physical sciences (e.g., trigonometry, algebra, soil mechanics, hydrology, etc.). The position also requires thorough knowledge of the methods and practices of highway construction engineering, highway design, and related policies, methods, procedures, and regulations; contract administration; surveying and related mathematics; and applicable State, federal, AASHTO, and FHWA requirements, standards, and specifications. Project oversight and supervisory responsibilities require knowledge of contract administration, engineering principles relative to contracted services, Department and State personnel procedures and policies, program requirements, and personnel management practices and techniques.

SKILLS:

This position requires skill in project management; analyzing and evaluating engineering designs; and specialized analytical methods and techniques. The position also requires skill in the use of standard and specialized software applications, field and office engineering instruments, computer modeling techniques, analyzing and interpreting statistical information, and written and verbal communications, especially technical communications required for development of engineering reports, specifications, and other technical information.

Behaviors required to perform these duties?

- **Analytical/Interpretive Thinking:** Accurately applies general engineering standards and contract administration requirements to specific engineering and contract administration issues.
- **Decision Making:** Evaluates multiple and ambiguous factors to resolve problems. Develops technically and legally defensible courses of action in response to engineering and design deficiencies.

- **Communication:** Translates technical information to audiences of varied technical levels. Explains, defends, and negotiates engineering solutions to contract or design deficiencies, corrective actions, incentives/disincentives, and other issues.
- **Independence of Action:** Determines appropriate responses to engineering and contract administration problems and deficiencies with minimal assistance or precedent.

Education:

Check the one box indicating minimum education requirements for this position for a new employee the first day of work:

- | | |
|---|--|
| <input type="checkbox"/> No education required | <input type="checkbox"/> Related AAS/2-years college/vocational training |
| <input type="checkbox"/> High school diploma or equivalent | <input checked="" type="checkbox"/> Related Bachelor's Degree |
| <input type="checkbox"/> 1-year related college/voc. training | <input type="checkbox"/> Related Master's degree |

Please specify the acceptable and related fields of study:

Required/Acceptable: Civil Engineering or Civil Engineering Technology.

Related: Environmental Engineering, Geologic/Geotechnical Engineering, or Engineering Science.

Other education, training, certification, or licensing required (specify): NONE SPECIFIED

Experience:

Check the one box indicating minimum work-related experience requirements for this position for a new employee the first day of work:

- | | |
|--|--|
| <input checked="" type="checkbox"/> No prior experience required | <input type="checkbox"/> 3 to 4 years |
| <input type="checkbox"/> 1 to 2 years | <input type="checkbox"/> 5 or more years |

Other specific experience (optional): NONE SPECIFIED

Alternative Qualifications:

This agency will accept alternative methods of obtaining necessary qualifications.

- Yes No

Alternative qualifications include: NONE SPECIFIED

SECTION IV – Other Important Job Information

NONE SPECIFIED

SECTION V – Signatures

Signature indicates this statement is accurate and complete.

Employee:

Name: _____ Title: _____

Signature: _____ Date: _____

Immediate Supervisor:

Name: _____ Title: _____

Signature: _____ Date: _____

Division/District Administrator:

Name: _____ Title: _____

Signature: _____ Date: _____

Department Designee:

Name: Jennifer Jensen Title: Administrator, Human Resource Division

Signature: _____ Date: _____
