STATE OF MONTANA
JOB DESCRIPTION

Montana state government is an equal opportunity employer. The State shall, upon request, provide reasonable accommodations to otherwise qualified individuals with disabilities.

Job Title: Load Rating Engineer Position Number: 50029, 50009 Location: Helena

Department: Transportation

Program Area and Bureau: Project Development and Delivery, Bridge

Section and Unit: Bridge Load Rating Section

Job Overview: This position is responsible for performing and developing all aspects of the Bridge Load Rating Program and serves as a statewide engineering lead for bridge analysis and load rating operations. An advanced level of professional engineering experience and judgement is necessary to evaluate the structural integrity and load carrying capacity of a diverse population of existing bridges and structures. This work directly affects public safety and commerce by identifying and evaluating bridge conditions, performing advanced structural analysis for the current conditions, and recommending load posting, traffic restrictions, or repair projects. This position coordinates and communicates regularly with the Bridge Inspection Section, Bridge Maintenance Section, Bridge Permitting Engineer, District Bridge Inspectors, Motor Carrier Services, and the Bridge Area Engineers. This position reports to the Bridge Load Rating Program Manager Engineer.

Essential Functions (Major Duties or Responsibilities):

Bridge Analysis and Load Rating – 75%

Performs advanced level structural analysis on existing structures across the state having a broad range of complexity, age, material types, and with various deterioration and conditions issues, and determing the Load Rating and safe operating capcity for each structure.

- Performs engineering analysis and load rating on prioritized groups of structures and for numerous vehicle configurations.
    - Researches material history and construction specifications at the time of bridge construction.

    - Locates archived plans, shop drawings, and other structural documents, and coordinates scanning and uploading of these documents to the MDT Structure Management System (SMS).
    - Analyzes complex structures while considering condition deterioration and structural damage.
    - Performs advanced computer modeling and in-depth structural analysis when simpler methods are insufficient to thoroughly evaluate a situation.
    - Documents all assumptions and results of the analysis and load rating.
    - Recommends maximum capacity for bridge load postings without unduly restricting freight traffic.
- Coordinates with district inspectors to determine the significance of changed conditions noted by the inspector, and how they affect the load carrying capacity of bridges.
    - Visits bridge sites as needed to determine the extent of condition deterioration, structural damage, or for documenting assigned load ratings.
    - Determines need for, and performs, structural analysis to determine bridge capacity based on changed conditions.
- Provides technical expertise on bridge analysis and load rating processes to the Bridge Bureau engineers and engineering consultants.
    - Provides technical assistance and expertise to the design crews for producing final load ratings for newly designed bridges and for unique design situations.
    - Reviews analysis outputs and other methods and results to ensure technical accuracy and consistency.
    - Provides guidance and direction on software applications and data input issues to ensure bridge structural modeling and input is consistent and reasonable.
    - Provides technical expertise of bridge rating using AASHTOWare BrDR software suite and other software programs such as Midas.
    - Attends national BrDR user group meetings. Provides feedback and input to the national BrDR steering committee for inclusion in future versions.
    - Recommends levels of funding for BrDR development.
- Coordinates consultant selection processes with the Consultant Design Bureau for bridge load rating term contracts.
    - Writes Requests for Proposal for consultant services.
    - Manages consultant term contracts for bridge load rating services.
    - Assembles load rating term assignments for consultants and prioritizes consultant work based on bridge risk factors.
    - Checks consultant load rating results for accuracy and consistency with MDT and FHWA guidelines. Provides SMS technical support to the Bureau and load rating consultants.
- Develops and implements guidance and policy on bridge load rating processes.
    - Ensures MDT load rating procedures comply with latest FHWA guidelines.

- Develops policy changes related to Load Rating for the MDT Bridge Inspection and Load Rating manual.
- Ensures all required load ratings are complete in time for MDT's yearly data submittal to FHWA.

Bridge Permitting - 20%

- Manages and performs overweight vehicle analysis to ensure department policies and restrictions maximize safety and structural integrity, while accommodating transportation and commerce needs of motor carriers and permitting processes.
  - Develops and revises policies and permit requirements to reflect changing dynamics
  - Coordinates with Motor Carrier Services Division staff and managers to evaluate customer service needs and permitting processes
  - Oversees vehicle analyses to integrate safety, efficiency, and economic considerations into reasonable and consistent restrictions.
- Manages and performs overweight truck permit analysis for specific route permitting by Motor Carrier Services.
  - Analyzes bridges along specific routes for the ability to allow movement of the overload and determines any restrictions that need to be applied using the most recent bridge condition data.
  - Coordinates with Motor Carrier Services Division staff and managers to evaluate customer service needs and permitting processes
  - Oversees route analyses to integrate safety, efficiency, and economic considerations into reasonable and consistent restrictions.
- Assists in writing and updating the MDT Bridge Permitting Manual.

Bridge Asset Management - 5%

- Analyzes bridge deterioration, preservation, and rehabilitation options
  - Provides information on bridge trends, deterioration rates, and severity, in order to identify bridges in need of repair, rehabilitation, and/or replacement.
  - Assists in optimizing maintenance strategies.
  - Assists in developing and implementing software for use in modeling deterioration and trends, and optimizing funding scenarios.
  - Works with the District Bridge Inspection Coordinators to identify the underlying engineering issues on specific deficiencies identified during condition inspections, and evaluates these issues for corrective action on individual bridges and for their implication to the statewide inventory of similar bridges.
  - Works with Bridge Design staff to help prioritize bridge repair and replacement projects.

- Performs site visits to evaluate structure conditions and capacities during emergencies, such as flooding and earthquake events.

Supervision

The number of employees supervised is: 0

The position number for each supervised employee is: not applicable

Physical and Environmental Demands:

Physical:

- This position functions in a typical office environment primarily.
- Must walk over uneven terrain or in water, climb structures spanning significant heights (i.e., 100+ feet), and use safety equipment (e.g., ropes, hardhats, etc.)
- Travel within the state to bridge locations (less then 500 miles per month), and out-of-state travel by airline to national conferences and meetings.

Knowledge, Skills and Abilities (Behaviors):

- This position requires a thorough and extensive knowledge of the theory, principles, methods and techniques of Civil Engineering and the associated mathematics and physical sciences, especially the methods and practices of bridge structural analysis.
- This position must be familiar with AASHTO Design and Load Rating Specifications and standards, MDT design and load rating standards and policies, industry guidelines and practices, and bridge and road construction methods.
- Project management
- Planning and organizing
- Working with and motivating peers and others not in a direct supervisory line
- Drawing conclusions and making recommendations based on often incomplete or conflicting information.
- Performing engineering analyses and applying engineering concepts, techniques and procedures to a variety of situations and circumstances.
- Evaluating structural problems by examining evidence, discussions with peers and inspection personnel, and calculations and contract documents to determine proper course of action
- Applying engineering judgment when interpreting load rating guidelines and standards
- Preparing calculations, reports, and other documentation necessary to complete load rating projects
- Effective writing and verbal communication skills are necessary

Minimum Qualifications (Education and Experience):

A bachelor's degree in Engineering from an ABET accredited Engineering program that includes civil structural engineering courses in structural analysis, steel design, and reinforced concrete design.

At least 4 years of bridge related load rating, condition inspection, design, or analysis experience.

Graduate degrees with concentrations in structural analysis and design will be evaluated on a case by case basis.

Registration as a Professional Engineer (PE) in Montana. Incumbents with PE registration in another State that are eligible for PE registration in Montana through Comity will be considered.

Special Requirements:

List any other special required information for this position

☐	Fingerprint check	☒	Valid driver's license
☐	Background check	☐	Other; Describe
	Union Code		Safety Responsibilities

The specific statements shown in each section of this description are not intended to be all inclusive. They represent typical elements and criteria considered necessary to perform the job successfully.

Signatures

My signature below indicates the statements in the job description are accurate and complete.

Immediate Supervisor	**Title**	**Date**

Administrative Review	**Title**	**Date**

My signature below indicates that I have read this job description.

Employee	**Title**	**Date**

Human Resources Review

Job Code Title: Professional Engineer 1 **Job Code Number: D25021**

My signature below indicates that Human Resources has reviewed this job description for completeness and has made the following determinations:

☐ FLSA Exempt ☒ FLSA Non-Exempt

☒ Telework Available ☐ Telework Not Available

☒ Classification Complete ☐ Organizational Chart attached

Human Resources:

Signature **Title** **Date**