

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: Hydraulic Engineering Specialist Position Number: 34010

Location: Helena

Department: Transportation

Division and Bureau: Highways and Engineering/Highways Bureau

Section and Unit: Hydraulics

Job Overview:

This position is the Term Contract Engineer for the Hydraulics Section. The Term Contract Engineer is responsible for coordinating and administering statewide consultant term contracts for hydraulic design studies relating to bridge replacement and highway reconstruction projects statewide. The position reports to the Hydraulics Operations Engineer (#34009) and does not directly supervise other agency personnel.

Essential Functions (Major Duties or Responsibilities):

Term Contract Administration – 60%

This position is responsible for coordinating and administering hydraulic term contracts for statewide bridge replacement and reconstruction projects to ensure the overall quality, efficiency, and contract compliance of services. The incumbent participates in consultant selection and is responsible for contract development, project monitoring, and quality assurance; establish priorities, estimate costs, and determine resource allocations for various projects; evaluates and recommends qualified consultants; develops contract scope of work and cost-estimates; coordinates project meetings with Bridge Bureau, Hydraulics Section, Districts, consultants, and others; analyzes, evaluates, and approves preliminary engineering reports; ensures effective implementation and integration of hydraulic design components; and reviews and approves contract claims and payments.

- Coordinates and oversees the Section's Hydraulic Term Contract Program for bridge replacement and reconstruction projects to ensure the quality, efficiency, and contract compliance of services. Evaluates and recommends procedures for consultant selection and is responsible for contract development, project monitoring, and quality assurance to reflect State and Department requirements as well as efficient operating procedures.
- Assesses statewide bridge replacement/reconstruction project needs, available resources, planned and existing workload, and Department objectives to establish priorities, estimate costs, and determine resource allocations for various projects.
- Evaluates and selects the most qualified consultants from contract service pools based upon specialized areas of expertise, demonstrated competencies on hydraulic engineering applications, and the specific nature of various projects. Recommend and justifies selections to the Consultant Selection Board to ensure concurrence.
- Develops contract scope of work and cost-estimates according to project scheduling requirements, resource availability, and the best interests of the Department. Provides value engineering recommendations to Bridge Bureau, Districts, and others to ensure cost-effectiveness while maximizing the quality and efficiency of replacement and reconstruction. Negotiates contract prices and completion schedules and issues notice to proceed when appropriate.
- Coordinates project meetings with Bridge Bureau, Hydraulics Section, Districts, consultants, and others throughout the course of projects to monitor progress; identify and resolve problems; and advise on engineering guidelines, standards, and procedures. Ensures compliance with contract specifications and negotiates alternatives as necessary to resolve conflicts and ensure that projects are completed according to specifications and on schedule.
- Analyzes and evaluates preliminary engineering reports to identify deficiencies, propose design alternatives, and approve recommendations for release to the Bridge Bureau. Ensures the technical quality of assessments and reports, conformance with engineering standards, and cost-effectiveness of proposed designs.
- Consults with Bridge and/or Road Design staff to ensure effective implementation and integration of hydraulic design components, resolve unforeseen deficiencies or other problems, and coordinate with District hydraulic engineers to keep apprised of activities.

Hydraulics Engineering Analysis and Design – 30%

This position coordinates and delivers a variety of hydraulic engineering and design projects, including responsibility for preliminary engineering analysis, mathematical model development (e.g., analysis of river systems, hydrologic analysis models, etc.), consultant design review and approval, technical and risk assessments, cost estimates, and final designs. The position develops unique hydraulic engineering solutions to construction, bridge design and scour, road design, environmental, geotechnical, materials, and other issues.

- Analyzes and evaluates field survey and site investigation data to determine the preliminary layout and hydraulic engineering requirements of planned and active construction sites.
- Conducts comprehensive analyses of in-service structures to determine the size, type, location, and overall condition of existing drainage structures; assess site risks and costs; and ensure compliance with engineering standards. Determines flood flows, culvert and bridge adequacy, and potential for bridge failure from scour. Conducts on-site evaluations and analyzes engineering calculations to determine structural integrity, enhancements, and maintenance requirements.
- Develops 1D and 2d hydraulic models of planned and existing hydraulic features to establish baseline performance profiles and determine the need for structural monitoring, replacement, and/or modification. Evaluates features of bridges and culverts, conducts flood plain studies, and evaluates interrelated impacts of various engineering models to determine the most appropriate and feasible options.
- Analyzes and evaluates consultant designs to determine viable alternatives that promote safety, longevity, and cost-effectiveness; protect environmental and aesthetic interests; ensure appropriate interpretation and application of engineering standards, proposed costs and timelines, and terms and conditions of various contracts; and comply with federal, State, tribal, and Department requirements. Recommends final design approval or modifications. Determines, explains, and justifies incentives and disincentives, plan modifications, and special circumstances as necessary.
- Develops new approaches and innovative alternatives to resolve hydraulic design problems and maximize the Department's human and materials resource commitments on various projects.
- Conducts risk assessments of various designs to determine overall public, aesthetic, and environmental risks of flood plain encroachment, irrigation facility failures, surface water permit ramifications, erosion, flooding, and other hazards that may threaten public safety and environmental health and result in legal liabilities for the Department. Evaluates assessments to determine the nature and severity of risk factors, develops design alternatives and solutions to minimize risks, and integrates changes into final designs.
- Develops and analyzes projected engineering project costs to establish contract estimates that reflect market trends, resource availability, and the best interests of the Department.
- Determines optimum hydraulic structures or modifications based upon site evaluations, engineering calculations, mathematical modeling data, and cost analyses. Develops preliminary designs based upon engineering determinations and standards, site-specific constraints, risk assessments, and environmental issues.
- Converts preliminary designs into final contract-ready design specifications by making final determinations on hydraulic engineering characteristics within the District and developing special provisions as necessary. Oversees designs prepared by consultant engineers to ensure compliance with engineering policies, procedures, and guidelines.

Other Duties – 10%

This position performs a variety of other duties as assigned by the Hydraulics Operations Engineer in support of the Department mission and Bureau objectives.

Supervision

The number of employees supervised is: 0

The position number for each supervised employee is: n/a

Physical and Environmental Demands:

Predominantly the work is performed in an office environment or occasionally in the field and may require:

- Lifting heavy objects (manhole caps, analytical equipment, etc.) up to 50 lbs.
- Ability to walk over uneven terrain or in water
- Remaining seated for extended periods of time, with occasional walking; standing; bending
- Minor travel (200 miles/month)
- Operating a personal computer
- Communicate in writing, in person, and over the phone
- Exposure to extreme weather
- Exposure to loud noises
- Exposure to confined spaces
- Exposure to high-speed traffic

Knowledge, Skills and Abilities (Behaviors):

Requires extensive knowledge of the theories, concepts, and principles of civil engineering, hydrology, hydraulics, fluvial geomorphology, river mechanics, and urban storm water and drainage systems. The position also requires thorough knowledge of the methods and practices of road and bridge construction and related policies, methods, procedures, specifications, and standards and regulations; environmental and geotechnical aspects of construction projects; contract administration; advanced research methods and techniques; and applicable state, federal, local/county, AASHTO, and FHWA requirements and standards.

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, 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.

Requires the ability to investigate, analyze, and form professional objective solutions to complex hydraulic engineering issues, water law, local and regional government objectives, Department construction and maintenance requirements, and other interests; plan, organize, and direct engineering activities; exercise sound engineering judgement when developing and implementing solutions to engineering problems, especially those involving natural phenomena (e.g., hydrology, fluvial geomorphology, etc.); and present and defend new or unprecedented ideas, procedures, and technologies. The position also requires the ability to negotiate and/or mediate disputes arising from contract, adjustments, flood plain permitting, city/county agreements, landowner disputes, etc.

Minimum Qualifications (Education and Experience):

The required knowledge and skills are typically acquired through a combination of education and experience equivalent to Bachelor’s Degree in Civil Engineering or a related field.

This position requires a minimum of 4 years of experience in civil engineering, with at least two of those years in hydraulics engineering.

Certifications, licensure, or other credentials include: Registration as a Professional Engineer is required.

Alternative qualifications include: none.

Special Requirements:

List any other special required information for this position

- | | |
|--|---|
| <input type="checkbox"/> Fingerprint check | <input type="checkbox"/> Valid driver’s license |
| <input type="checkbox"/> Background check | <input type="checkbox"/> 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
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Administrative Review	Title	Date
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My signature below indicates that I have read this job description.

Employee	Title	Date
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Human Resources Review

Job Code Title: Civil Engineering Specialist Job Code Number: 172537 Pay Band: 7

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

- | | |
|---|--|
| <input type="checkbox"/> FLSA Exempt | <input checked="" type="checkbox"/> FLSA Non-Exempt |
| <input type="checkbox"/> Telework Available | <input checked="" type="checkbox"/> Telework Not Available |
| <input checked="" type="checkbox"/> Classification Complete | <input type="checkbox"/> Organizational Chart attached |

Human Resources:

Signature	Title	Date
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