

POSITION DUTY STATEMENT

DOT PM-0924 (REV 01/2025)

CLASSIFICATION TITLE Transportation Engineer (Civil)	OFFICE/BRANCH/SECTION SM&I/Office of Specialty Investigations/Hydraulics Branch	
WORKING TITLE Hydraulic Engineer	POSITION NUMBER 913-624-3135-045	REVISION DATE 05/20/2026

As a valued member of the Caltrans team, you make it possible to improve lives and communities through transportation.

GENERAL STATEMENT:

Under the general direction of the Branch Chief (Senior Bridge Engineer [Sup]), in the Division of Maintenance, Structure Maintenance and Investigations (SM&I), Office of Specialty Investigations, Hydraulics Branch, the incumbent is responsible for performing hydrology, hydraulic and scour appraisals (comprised of scour assessment and scour evaluation) to determine the scour vulnerability of in-service highway bridges on the State and Local highway networks in accordance with the federal regulation in 23 CFR Part 650 Subpart C National Bridge Inspection Standards (NBIS). The duties include: (i) Performing hydraulic and scour inspections, including flood/storm monitoring, (ii) Reporting the results of field and office investigations/ appraisals in comprehensive, accurate, and timely written engineering reports, ensuring compliance with the Specifications for the National Bridge Inventory (SNBI), the Bridge Inspector's Reference Manual (BIRM), the Manual for Bridge Evaluation (MBE), the Caltrans Bridge Element Inspection Manual (ELI), Federal Highway Administration (FHWA) guidance documents such as Hydraulic Engineering Circular (HEC) No. 18 (Evaluating Scour at Bridges), and SM&I Procedures Manual, (iii) Develop and maintain a written Scour Plan of Action (POA) document for critical bridges, (iv) During emergency events, the incumbent may be required to work off-peak hours to respond to bridge damage and direct field crews in the repair and stabilization of damaged bridges, (v) Develop scour countermeasure alternatives using guidance documents such as HEC-23 (Bridge Scour and Stream Instability Countermeasures).

CORE COMPETENCIES:

As a Transportation Engineer (Civil), the incumbent is expected to become proficient in the following competencies as described below in order to successfully perform the essential functions of the job, while adhering to and promoting the Department's Mission, Vision, Values, Strategic Imperatives and Goals. Effective development of the identified Core Competencies fosters the advancement of the following Leadership Competencies: Change Commitment, Risk Appetite, Self-Development/Growth, Conflict Management, Relationship Building, Organizational Awareness, Communication, Strategic Perspective, and Results Driven.

- **Flexibility and Managing Uncertainty** : Adjusts thinking and behavior in order to adapt to changes in the job and work environment. (Safety, Employee Excellence - Collaboration, Integrity, Stewardship)
- **Decision Making**: Makes critical and timely decisions. Takes charge. Supports appropriate risk. Makes challenging and appropriate decisions. (Safety, Employee Excellence - Innovation, Integrity, Stewardship)
- **Reliability**: Ability to demonstrate dependability in meeting commitments, and providing a consistent work product. Takes responsibility for individual actions in order to meet deadline demands. (Safety, Employee Excellence - Collaboration, Integrity)
- **Problem-solving and Decision-making** : Identifies problems and uses logical analysis to find information, understand causes, and evaluate and select or recommend best possible courses of action. (Safety, Prosperity, Employee Excellence - Equity, Innovation, Integrity)
- **Teamwork/Partnership**: Develops, maintains, and strengthens partnerships with others inside or outside of the organization through effective communication and collaboration. (Safety, Equity, Employee Excellence - Collaboration, Pride, Stewardship)
- **Organizational Awareness**: Contributes to the organization by understanding and aligning actions with the organization's strategic plan, including the mission, vision, goals, core functions, and values. (Safety, Equity, Climate Action - Collaboration, Innovation, People First)
- **Communication**: Expresses oneself clearly in all forms of communication. Gives feedback and is receptive to feedback received. Knows that listening is essential. Keeps others in the Division and other functional units informed as appropriate. (Safety, Employee Excellence - Collaboration, Equity, Stewardship)
- **Analytical Skills**: Approaches problems using a logical, systematic, and sequential approach. Weighs priorities and recognizes underlying issues. (Safety, Employee Excellence - Innovation, Integrity)
- **Thoroughness**: Ensures that work and information is complete and accurate. Ensures that assignment goals, objectives, and completion dates are met. Documents and reports on work progress. (Safety, Employee Excellence - Integrity, Stewardship)

TYPICAL DUTIES:

Percentage	Job Description
Essential (E)/Marginal (M) ¹	

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45%	E	Perform hydrology and hydraulic engineering analysis, and special investigation needed for the completion of scour evaluation studies in the Hydraulics Branch. Such work may involve hydrologic modeling, 1D and 2D hydraulic modeling, sediment transport studies, fluvial morphology studies, use of Geographical Information Systems (GIS), complex bridge scour evaluations and design of scour countermeasures. This will require extensive office research of historic bridge inspections, land use and flood impacts. Results from such studies must be documented in a comprehensive engineering report and may be presented in technical meetings.
35%	E	Collect field data for use in various hydraulic and scour analysis. Field work may include hydraulic inspections, determination of hydraulic causes of existing problems, detailed field surveying and collection of specialized hydraulic data. The incumbent will perform field inspections from a boat, land and air using Multibeam Echosounder (MBES), Acoustic Doppler Current Profiler (ADCP), Total Station, GPS and Unmanned Aerial Systems (UAS). Field work will necessitate making visual observations over extensive distances of the channel and terrain which may require climbing, crawling, wading and walking.
10%	E	Incumbent will monitor the potential effects of flooding on the stability of the bridge, channel, bank protection and scour countermeasure devices. Such monitoring includes collecting field data, developing and maintaining written Scour Plan of Action documents, and assessing changes that may impact the safety of bridges.
10%	M	Perform miscellaneous engineering, training and administrative functions related to bridge inspections and maintenance, as directed by the Branch Chief or Office Chief.

¹ESSENTIAL FUNCTIONS are the core duties of the position that cannot be reassigned.
MARGINAL FUNCTIONS are the minor tasks of the position that can be assigned to others.

SUPERVISION OR GUIDANCE EXERCISED OVER OTHERS

This position does not supervise other employees. The incumbent may function as a lead person or coordinate the activities of various Department engineering and technical personnel or external partners.

KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

Must have a solid understanding of hydrology and hydraulic principles and methods.

Knowledge of scour processes and the complex interactions between streams and structures is desirable.

The incumbent should be willing to learn the basics of sediment transport, fluvial morphology, 2D hydraulic modeling, and surveying, and should develop proficiency in the principles of scour countermeasure design as outlined in HEC 23.

The position requires strong written and verbal communication skills in English, with the ability to make neat and accurate engineering field notes and prepare clear and concise technical reports.

The ability to apply sound engineering judgment in field conditions and analyze factors affecting the safe load capacity of bridges.

The ability to collect physical and statistical data in field conditions and accurately maintain that data in a comprehensive database.

The ability to work independently and make decisions with a minimum of direction or supervision.

The ability to travel and work throughout California on a routine basis. Must possess a valid California Driver's License.

The incumbent must demonstrate a willingness to learn from others and apply the knowledge needed to complete project-specific tasks effectively.

RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

Under the supervision of the Branch Chief, the Hydraulic Engineer is responsible for the development, interpretation and presentation of hydraulic design data for use in the preparation of structure plans, scour countermeasure plans to protect facilities, and scour analysis. Poor decisions or incomplete work may result in inadequate designs or a wrong scour susceptibility determination. Errors in judgement and/or decisions could directly affect public safety. Inaccurate, delayed or incomplete bridge investigation and reporting activities may result in a reduction of public mobility, increased maintenance/operations costs, inaccurate project scope, unnecessary delays in bridge rehabilitation or replacement projects, and potential tort liability for the Department.

PUBLIC AND INTERNAL CONTACTS

The incumbent maintains communication with all personnel on his/her projects including those from the Division of Maintenance,

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Structure Maintenance & Investigations, Office of Structural Design & Analysis, other Divisions, Districts, local agencies and various governmental agencies.

PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

The incumbent must be able to make critical safety decisions during emergencies with minimal supervision. They must participate in required first aid and safety training and may need to administer first aid when necessary.

Good hearing and vision are essential for safely receiving directions, monitoring traffic and equipment, and performing assigned duties. The incumbent must be able to travel and work closely with other engineers as part of a team. The role requires extended periods of sitting while driving vehicles or boats or while using a computer. The work requires the incumbent to occasionally lift light to moderately heavy objects (up to 65 lbs.), operating tools and equipment which may involve grasping, fine manipulation, overhead reaching, twisting, squatting, crouching, balancing, or bending—often in confined spaces or on elevated structures, while observing and recording inspection results.

Bridge inspections may require working in extreme weather conditions—including high heat, strong winds, and heavy precipitation—navigating steep and/or uneven terrain, climbing barbed wire fences up to 8 feet high, and moving through confined spaces. The incumbent may also need to climb ladders, catwalks, or scaffolding and perform duties at heights of up to 300 feet above ground or water.

The incumbent may work in channels or river crossings under bridges, sometimes in water exceeding 6 feet in depth, requiring wading, operating powered boats, or using flotation devices. They must safely operate boats and related equipment in strong currents or adverse weather.

Ability to drive state vehicles (often large trucks and/or vans). A valid California Driver's License is required when operating state vehicles and equipment.

WORK ENVIRONMENT

Approximately 67% of the incumbent's time will be spent in a typical office setting performing analysis work. The office environment is in a climate-controlled building with stairs, elevator, carpet, and open modular cubicle style workstations. The office is in Sacramento.

Approximately 33% of the time will be spent in the field performing investigations of State and Local agency owned bridges throughout the state and often away from the employee's home and the Sacramento Headquarter Office. The required travel will include overnight stays for one or several contiguous days, and approximately one to two weeks per month depending on the workload. The field work environment includes hazards such as live traffic, indigent people and their debris, animals (wild and domestic), construction activities, trip and slip hazards, loud noises, dust, poisonous vegetation, as well as working in and around rivers, streams, lakes, canals, and various other waterways. The work also requires the incumbent to work outdoors during all seasons of the year, under extreme temperature variations and inclement weather.

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I have read, understand and can perform the duties listed above. (If you believe you may require reasonable accommodation, please discuss this with your hiring supervisor. If you are unsure whether you require reasonable accommodation, inform the hiring supervisor who will discuss your concerns with the Reasonable Accommodation Coordinator.)

I agree that by providing my electronic signature for this form, I agree to conduct business transactions by electronic means and that my electronic signature is the legal binding equivalent to my handwritten signature. I hereby agree that my electronic signature represents my execution or authentication of this form, and my intent to be bound by it.

EMPLOYEE (Print)

EMPLOYEE (Signature)	DATE
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I have discussed the duties with, and provided a copy of this duty statement to the employee named above.

SUPERVISOR (Print)

SUPERVISOR (Signature)	DATE
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