

POSITION DUTY STATEMENT

DOT PM-0924 (REV 01/2025)

CLASSIFICATION TITLE Sr Bridge Eng	OFFICE/BRANCH/SECTION HQ/Maintenance/SM&I/Office of Specialty Investigations	
WORKING TITLE Bridge Hydraulic Inspection Senior	POSITION NUMBER 913-624-3185-XXX	REVISION DATE 11/02/2025

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

GENERAL STATEMENT:

Under the direction of the Chief of the Office of Specialty Investigations at Structure Maintenance and Investigations (SM&I), the incumbent is responsible for supervising and directing engineering staff who perform federally mandated scour appraisals (comprised of scour assessments and scour evaluations) 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), and reporting the results of both field and office investigations/appraisals in comprehensive, accurate, and timely written engineering reports. The duties include (i) Assigning, directing, and overseeing the hydraulic inspections and scour analysis work of the engineer staff under his/her supervision, (ii) Quality control reviews of the hydraulic inspections, analysis, and hydraulic inspection reports, bridge work repair recommendations, and Scour Plans of Action (POAs) (iii) Performing hydraulic inspections, including routine hydraulic inspections, flood/storm monitoring of Scour Critical bridges, and response to emergency situations, (iv) Providing technical advice on scour-related or hydraulic-related issues to individuals both inside and outside the Department, (v) Implementing and ensuring compliance with the NBIS, the Specifications for the National Bridge Inventory (SNBI), the Bridge Inspector's Reference Manual (BIRM), the Manual for Bridge Evaluation (MBE), the Metrics for the Oversight of the National Bridge Inspection Program, the Caltrans Bridge Element Inspection Manual, Federal Highway Administration (FHWA) guidance documents such as Hydraulic Engineering Circular (HEC) No 18 (Evaluating Scour at Bridges) and HEC-23 (Bridge Scour and Stream Instability Countermeasures), and the SM&I Procedures Manual, (vi) Participating in research, including technical committees, related to the evaluation of the scour vulnerability of bridges.

The incumbent must possess and maintain a valid certificate of registration as a Civil Engineer in California, and a C California Driver License.

The incumbent must be certified, or obtain certification within 12 months, as a Team Leader in accordance with the NBIS. This certification shall be maintained over the entire period of performing the duties of the position.

Possession of, or obtaining an FAA Part 107 Small Unmanned Aircraft Systems (UAS) Remote Pilot Certificate is desirable but not required.

The incumbent must be registered as a Civil Engineer in California.

CORE COMPETENCIES:

As a Sr Bridge Eng, 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.

- **Change Leadership:** Develops new and innovative approaches needed to improve effectiveness and efficiency of work products. Encourages others to value change. Considers impact and recommends changes. (Employee Excellence - Innovation)
- **Decision Making:** Makes critical and timely decisions. Takes charge. Supports appropriate risk. Makes challenging and appropriate decisions. (Safety - 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. (Employee Excellence - 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 - Stewardship)
- **Teamwork and Collaboration:** Sets team structure. Organizes, leads, and facilitates team activities. Promotes team cooperation and encourages participation. Capable of cross functionality and working well with others on a team to achieve personal goals, team goals, and organizational goals. Takes responsibility for individual actions in order to achieve consistent results. (Prosperity - Collaboration)
- **Understanding Others/Motivation:** Understands why groups do what they do and their motivation. Is able to look from multiple perspectives in order to understand others. (Employee Excellence - People First)

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- **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. (Employee Excellence - Pride)
- **Analytical Skills:** Approaches problems using a logical, systematic, and sequential approach. Weighs priorities and recognizes underlying issues. (Safety - Stewardship)
- **Technical Expertise:** Depth of knowledge and skill in a technical area. (Employee Excellence - Stewardship)

TYPICAL DUTIES:

Percentage	Essential (E)/Marginal (M) ¹	Job Description
20%	E	Supervise and direct engineering staff who perform federally mandated scour appraisals (comprised of scour assessments and scour evaluations) to determine the scour vulnerability of in-service highway bridges on the state and local highway networks in accordance with the 23 CFR 650 Subpart C (NBIS), and who report the results of both field and office investigations/appraisals in comprehensive, accurate, and timely written engineering reports. Make hydraulic inspection and scour analysis assignments to the staff under his/her supervision and update these assignments on an ongoing basis. Implement the initial scour evaluations, periodic monitoring, flood/storm monitoring, and scour re-evaluations of bridges on the state and local highway networks. Review and address the scour-related or hydraulic related work requests from the SM&I inspectors or the bridge owners/custodians, and incorporate them into the staff work assignments.
20%	E	Perform field reviews of at least 10% of the hydraulic inspections and office reviews of 100% of the hydraulic inspection reports of the engineering staff under his/her supervision to ensure that the inspections are in compliance and conformance with the NBIS, SNBI, BIRM, MBE, the Metrics for the Oversight of the National Bridge Inspection Program, the Caltrans Bridge Element Inspection Manual, both HEC 18 and HEC-23, and the SM&I Procedures Manual. Ascertain that the coding of the SNBI Item B.AP.03 (Scour Vulnerability) reflects the current condition of the bridge regarding its vulnerability to scour. Review the work recommendations for scour countermeasures to ensure that they are adequate to mitigate an existing problem(s) with scour and to reduce the risk of bridge failure during a flood event. Review Scour POAs for scour-critical bridges (SNBI Item B.AP.03 = C, D, U) to confirm that they are sufficient for monitoring and correcting known and potential scour deficiencies. Ensure that Critical Findings of bridge damage are immediately reported to the structure owners/custodians and the FHWA.
15%	E	Oversee the analysis work of the engineering staff under his/her supervision, which may involve hydrologic modeling, 1-dimensional and 2-dimensional hydraulic modeling, sediment transport modeling, use of Geographic Information Systems (GIS), complex bridge scour analysis, and design of scour countermeasures.
15%	E	Perform hydraulic inspections of in-service highway bridges, scour countermeasures, and water channels in the vicinity of the bridges. The field work will include routine hydraulic inspections, flood/storm monitoring of scour critical bridges, response to emergency situations of bridge damage, determination of hydraulic causes of existing scour problems, detailed field surveying, and collection of specialized data for use in hydraulic and scour analyses. The inspections will be performed from land and/or boat, and may utilize a multibeam sonar, Acoustic Doppler Current Profiler (ADCP), Total Station and GPS survey equipment. The field work will involve visual observations over extensive distances in the channels and may require wading, probing, climbing and boating.
10%	E	Provide technical advice on scour-related or hydraulic-related issues to individuals both inside and outside the Department (SM&I inspectors, SM&I Maintenance Design, District personnel, local agencies, and consultants).
5%	E	Implement and ensure compliance with the NBIS, SNBI, BIRM, MBE, the Metrics for the Oversight of the National Bridge Inspection Program, the Caltrans Bridge Element Inspection Manual, both HEC-18 and HEC-23, and the SM&I Procedures Manual. Develop policies and procedures regarding scour appraisals, assessments, and evaluations. Incorporate new methodologies, equipment, and modeling tools into the scour evaluations.
5%	E	Participate in research related to the evaluation of the scour vulnerability of bridges, which may involve work on state and national technical committees.

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10% M Perform miscellaneous engineering or administrative functions related to maintenance and investigations of highway structures, as directed by the Chief of the Office of Specialty Investigations or the Deputy Division Chief of SM&I.

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

The incumbent will supervise and direct a staff of several engineers who perform scour appraisals to determine the scour vulnerability of in-service highway bridges on the state and local highway networks, and reports the results of both field and office investigations/appraisals in a concise and comprehensive written engineering reports.

KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

The incumbent is required to have thorough knowledge of the standards, specifications, manuals, policies and procedures for evaluation of the scour vulnerability of in-service bridges, which is a complex process that may include stream stability assessment, geomorphic assessment, hydrologic, hydraulic and scour analyses, foundation capacity and stability analyses, field inspection, and coding SNBI Item B.AP.03 as well as other SNBI codes which pertain to bridge and channel hydraulics.

The incumbent is required to be familiar with the methods for hydrologic, hydraulic, and scour analyses of various stream/structure interfaces, sediment transport, fluvial geomorphology, hydraulic modeling, surveying principles, and computer programs for 1-dimensional and 2-dimensional hydraulic flow modeling, such as HEC-RAS and SRH-2D.

The incumbent is required to have the ability to: (i) perform visual observations, measurements, testing and checks during the inspections, (ii) use engineering judgment to assess the structural condition, functionality, and load-carrying capacity of highway bridges, (iii) take accurate field notes of the observed deficiencies and report the inspection results in comprehensive reports, (iv) collect physical and statistical data for use in computer database and analysis programs, and (v) work independently and make decisions with minimum direction or supervision.

The incumbent is required to be thoroughly familiar with the Caltrans Employee Safety Manual, the Caltrans Maintenance Manual, and the Code of Safe Operating Practices of the Caltrans Maintenance Program.

The incumbent must be able to make accurate and effective decisions during stressful situations, such as during an emergency response or while working in difficult conditions and environments.

The incumbent is required to have good written and oral command of the English language, be able to write technical documents and make oral presentations.

The incumbent is required to be proficient in the use of computer programs for word processing, spreadsheet computations, engineering analysis, and databases.

The incumbent is required to be registered as a Civil Engineer in California.

The incumbent is required to attain certification as a Team Leader in accordance with the NBIS, 23 CFR Part 650, § 650.309 (b) (1) by successfully completing FHWA-NHI-130055 Safety Inspection of In-Service Bridges at its first delivery by Caltrans after being hired in this position and maintain such certification thereafter.

RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

Errors in judgment, decisions, and/or lack of knowledge regarding safety procedures could have life-threatening consequences for the incumbent and others, and could jeopardize public safety.

Inaccurate, delayed or incomplete bridge inspections and/or inspection reports may result in: (i) reduction of public mobility, (ii) increased maintenance and operations costs, (iii) inaccurate scope and unnecessary delays in repair, rehabilitation, or replacement projects, (iv) potential tort liability for the Department, and (v) non-compliance with the federal bridge inspection mandates, which may cause sanctions by the FHWA such as withholding or forced re-direction of federal reimbursement funds.

PUBLIC AND INTERNAL CONTACTS

The incumbent is expected to have regular written and/or verbal contacts with the maintenance, construction, local assistance and traffic operations personnel at various Caltrans districts and divisions, other state departments, and local agencies.

The incumbent may be required to present and discuss critical findings, inspection results, and work recommendations with state, local agency, and FHWA staff.

The incumbent may have verbal contacts with members of the public during inspections or public hearings.

The incumbent may be required to provide expert information and recommendations to technical committees on the scour

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evaluation of in-service bridges.

PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

The incumbent will be required to make decisions in emergency situations involving employee or public safety, or bridge safety or stability with or without direction from his/her supervisor.

The incumbent is required to participate in safety training, wear personal protection equipment, and administer first aid in the field in the event of an injury.

Hearing and sight are essential for job performance. The incumbent must be able to see traffic, equipment, obstructions, gages, controls, warning signs and warning lights, and hear traffic, equipment, directions, and warning sounds in order to perform his/her duties safely.

The incumbent is required to travel away from the office for day or overnight trips for up to 2 weeks per month.

The incumbent is required to drive state vehicles and use commercial transportation. The incumbent must have a valid California Driver's License in order to drive a state vehicle. The incumbent must be able to operate a variety of access equipment, including boats and UAS. This will involve the ability to utilize motor skills to operate and manipulate hand and foot controls, gears and other vehicle parts that control the motor or machinery.

The incumbent is required to travel with and work closely with other members of the inspection team.

The incumbent may be required to walk up and down steep inclines, walk or stand near sudden elevation breaks higher than 6 ft, climb fences, perform inspections at heights up to 700 ft above ground or water, work in the channels underneath or in the vicinity of bridges where the water depth that may exceed 6 feet, wade in water up to 3 ft deep and in currents with velocity up to 1.5 ft/sec, utilize flotation devices, and operate powered boats.

The incumbent may be required to lift and operate inspection tools and access equipment, which weigh as much as 65 lbs. These operations may involve grasping, manipulation, reaching overhead, twisting, lifting, squatting, crouching, balancing or bending while carrying the tools and equipment, and while observing defects and recording results.

The incumbent may need to sit for long periods of time when traveling or using a computer.

WORK ENVIRONMENT

The work will be approximately 75% in the office and 25% at various field locations throughout California.

The incumbent must be able to travel by driving a State vehicle or by using commercial transportation. He/she may be required to be away from the office for day or overnight trips. In addition, the incumbent may need to respond to emergency situations related to bridge damage.

While in the office, the incumbent will work in a climate-controlled environment, under artificial lighting, in a building with open space cubicle style workstations.

While in the field, the incumbent will work outdoors, near traffic, in lane closures, day or night. He/she may encounter the following environments and entities: sun, heat, cold, rain, sleet, snow, fog, wind, noise, dust, dirt, trash, exhaust gases, chemicals, contaminated ground and water, unregulated human encampments, animals (such as snakes, birds, bats, spiders and rats) and their droppings, plants (such as poison oak, ivy and vines), various physical and terrain features at the highway structures (such as confined spaces, rough terrain, uneven surfaces, elevation breaks, trip and slip hazards, waterways and heights), and a variety of sometimes extreme weather conditions and climates that occur in California.

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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

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

SUPERVISOR (Print)

SUPERVISOR (Signature)

DATE