

POSITION DUTY STATEMENT

DOT PM-0924 (REV 01/2025)

CLASSIFICATION TITLE Materials and Research Engineering Associate (Specialist)	OFFICE/BRANCH/SECTION District 6 Construction Materials	
WORKING TITLE District Materials MREA	POSITION NUMBER 906-501-3381	REVISION DATE 01/2025

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

GENERAL STATEMENT:

Under the direction from a Senior Transportation Engineer the Materials Engineer is responsible for administering the Material Plant Quality Program, leading, and performing laboratory operations and testing, maintaining compliance with American Association of State Highway and Transportation Officials (AASHTO) Resource laboratory and other accreditations, leading, and performing materials related investigations and delivery of reports. This includes but is not limited to directing and assisting in the performance of CTM, AASHTO, and ASTM test methods, delivering timely test results to Resident Engineers, reviewing, and completing construction forms, checking calculations, leading, and performing investigations in the development and delivery of material, pavement, failure analysis, and other reports related to the Materials function.

CORE COMPETENCIES:

As a Materials and Research Engineering Associate (Specialist), 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. (Employee Excellence - Collaboration, Integrity, Stewardship)
- **Dealing with Ambiguity (Risk)**: Can comfortably handle risk and uncertainty, as well as make decisions to act without having the total picture. (Climate Action, Employee Excellence - Collaboration, Innovation)
- **Ethics and Integrity**: Demonstrated concern to be perceived as responsible, reliable, and trustworthy. Respects the confidentiality of information or concern shared by others. Honest and forthright. Conforms to accepted standards of conduct. (Employee Excellence - Integrity, Stewardship)
- **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. (Employee Excellence - Collaboration, Integrity, Stewardship)
- **Relationship Building**: The ability to develop and maintain internal and external trust and professional relationships, which includes listening and understanding to build rapport. (Employee Excellence - Collaboration, Stewardship)
- **Customer Focus**: Considers, prioritizes, and takes action on the needs of both internal and external customers. (Employee Excellence - Collaboration, Stewardship)
- **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 - Collaboration, Integrity, Stewardship)
- **Analytical Skills**: Approaches problems using a logical, systematic, and sequential approach. Weighs priorities and recognizes underlying issues. (Employee Excellence - Collaboration)
- **Technical Expertise**: Depth of knowledge and skill in a technical area. (Employee Excellence - Integrity, Pride, Stewardship)

TYPICAL DUTIES:

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

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40%	E	<p>Administers the Material Plant Quality Program (MPQP) including conducting plan truck/equipment inspections to ensure safety requirements are met, instruments are properly calibrated, plant operations are functional, etc.</p> <p>Coordinate (may lead) laboratory operations and perform testing including but not limited; to cataloging and processing samples for quality assurance testing according to standard specifications, including but not limited to: Section 39 (Hot Mix Asphalt), Section 25 (Aggregate Subbases), Section 26 (Aggregate Bases), Section 90 (Concrete), and soils (in supporting design investigations). Tests include but are not limited to, gradations, specific gravities, gyratory compactions, asphalt contents, Hamburg wheel tracks, tensile strength ratios, and volumetric calculations. Inputs test result data into worksheets and databases. Obtain and maintain certification of California Test, AASHTO, and ASTM methods performed by the Lab. Checks test result calculations and construction form values. Deliver timely test results by email or fax. Reviews project plans and specifications or other requirements for any specialized testing needs. Monitors the contractor's operation for compliance with the specified testing procedures.</p> <p>Prepares materials reports for pavement structure, culvert corrosion, and deflection study recommendations through leading and conducting investigations and analysis including but not limited to; exploring and determining field conditions by operating and maintaining powered and non-powered equipment to perform sampling and testing, determining soil, loading, environmental conditions, etc., to be used as basis for design and recommendations, performing preliminary research and data acquisition, coordinating with other units/departments/agencies in facilitating pavement/soil during testing including working in highway traffic lanes and rough off highway terrain. Maintain records of all materials reviews, and correspondence.</p>
30%	E	<p>Maintains AASHTO Resources accreditation by following an AASHTO R18 compliant Quality Management System. Compiles a Quality Manual for AASHTO to review biennially, consisting of but not limited to proficiency sample program participation, documentation training, and documentation of the maintenance, calibration, and verification of lab equipment.</p> <p>Provide Construction Support including evaluating and recommending solutions to pavement and materials issues resulting in construction contract change orders. Provide input to construction contract claims resolutions. Provide specification support including recommendation of appropriate specifications for inclusion in highway construction contract documents relative to soils, bases, pavements, surface treatments, and other materials in highway facilities. Project management Support including project resource estimations of the work breakdown structure for justification of workload in Materials Engineering, and resource management.</p> <p>Perform and report on pavement failure investigations by sampling, coring, and other physical means as a basis to collected field data, determine failure characteristics, etc.</p>
10%	E	<p>Assist Construction staff in understanding of testing procedures, results and impacts upon work performed. Analyze whether differences in Quality Control and Quality Assurance test results are within acceptable ranges or require 3rd party disputes. Actively participates in constructability reviews including project PS&E packages for applicability and completeness, represents the unit at Constructability Review meetings and PDT meetings.</p>
10%	E	<p>Perform pavement smoothness testing and analysis including operation, calibration, and maintaining inertial profilers. Present data and analysis collected from inertial profiler measurements.</p>
5%	E	<p>Attend training courses, provide formal or informal training to others, participate in internal and external teams and committees, and attend meetings.</p>
5%	M	<p>Perform and train other employees on operating and calibrating lab equipment. Compose laboratory manuals for district lab. Work with district Equipment Coordinators to put together the estimates and purchase order list of supplies and equipment needed for the district and field labs.</p>

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

None. Incumbent, if Range D, will serve as lead worker and may be called upon to act in absence of the supervisor for a short

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duration. Incumbent may serve as a lead for functional guidance in training and assisting less experienced employees.

KNOWLEDGE, ABILITIES, AND ANALYTICAL REQUIREMENTS

Must know California Test Methods, AASHTO test methods, and ASTM test methods. Must have knowledge of the Highway Design Manual, Construction Manual, safety practices, Standard Specifications, and Special Provisions. Must possess knowledge in mathematics, statistics, civil engineering; Basic principles of physics, chemistry, and mathematics as applied to civil engineering; properties and uses of engineering materials; methods and equipment of engineering construction; and engineering economics; Highway terminology and concepts including but not limited to horizontal alignment, vertical alignment, structural sections, level of service, and construction.

Have the ability and knowledge to assess the working order of laboratory and field-testing equipment and machinery as well as calibrate and maintain them.

Must be able to perform California Test Methods, AASHTO test methods, and ASTM test methods; inspect testing equipment to ensure that it is within accepted tolerances; communicate effectively in both verbal and written form; use and understand computers to prepare reports and correspondence; organize/arrange data producing effective work products without repetitious direction; possess interpersonal skills necessary to be an effective team member; read and write English at a level required for successful job performance; analyze situations accurately and take effective action; perform technical studies and investigations independently or as a team member.

Incumbent is required to exercise analytical skill to determine if construction work meets specification requirements; if Quality Control results appear to be accurate; to interpret plans and specifications correctly as they pertain to tests required, meaning of test results, and turnaround times.

Must have knowledge of weights and measures, knowledge of current testing methods, current specifications, and guidelines regarding Materials Plant Operations, the position requires sophisticated knowledge of materials sampling and testing.

Knowledge of equipment, material manufacturing processes, and methods used in the construction of state highways and bridges.

Must be able to operate and understand various office machines including personal computers and programs such as the Microsoft Office Suite and various pavement structure and culvert corrosion analysis programs.

RESPONSIBILITY FOR DECISIONS AND CONSEQUENCES OF ERROR

Acceptance or rejection of a contractor's materials and work is usually based on results of materials tests. It is imperative that tests are performed in accordance with accepted procedures. Errors in materials testing could cause the contractor undue cost and delay. Highway design is dependent on materials testing and errors in testing and interpretation of test results increases construction costs, cause defective highways, possible injury and/or damage, and potentially expose the State to liability issues. An error in decision, judgment, or the processing of estimates or other contract administration paperwork would result in errors in payment to contractors and/or providers of service under contract with the Department. Poor engineering decisions made by incumbent could cause reduction of productivity.

Poor judgment may unnecessarily delay projects, increase engineering, construction, and/or maintenance costs, allow lower quality of work, and cause mismanagement of public monies.

Failure to understand and failure to incorporate appropriate standards, requirements and policies may result in expensive waste of time, cause additional work, subvert State to liability, missed deadlines, and budget issues. Errors in judgment when dealing with contractors could complicate contract issues; errors in dealing with the public could result in a poor public image for the Department.

Incumbent is responsible for his/her actions, decisions, quality of work, and proper use of State time, equipment, and materials. Improper performance of duties and/or failure to adhere to established policies, procedures and guidelines could lead to adverse action and possible termination.

PUBLIC AND INTERNAL CONTACTS

Incumbent must be able to communicate effectively with others including Department staff, technical/professional level staff of outside agencies, contractor's personnel, and members of the public regarding construction projects. Has extensive contact with private contractors, Resident Engineers and their staff, and other branches, both District and Headquarters. Incumbent must be able to communicate effectively with Contractor's personnel, property owners and internal personnel. Good communicative skills are essential in carrying out the duties.

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PHYSICAL, MENTAL, AND EMOTIONAL REQUIREMENTS

Must possess the ability to work on uneven ground, climb, lift, carry, bend, squat, kneel, crouch, reach, pull, push, grasp, sit, stoop, crawl, and repetitive use of extremities. Must be able to transport variety of objects that are less or equal to 40 pounds. Hard hat and safety vest or approved safety shirt must be always worn in the field, no exceptions. May be required to sit for long periods of time. May be required to stand for long periods of time. Ability to work in lab conditions. Ability to work indoors and outdoors. Ability to work under artificial light.

The workload is subject to frequent, substantial, and unexpected changes. Workload may subject employee to frequent changes of shift, frequent changes of work hours and workdays, and geographic transfer. Travel may be required. Night-work, overtime and/or

flexible hours may be required. Must be able to organize and prioritize. Must be able to concentrate, formulate effective strategies, adapt to changes in priorities, and complete complex tasks or projects with adequate notice. Ability to resolve emotionally charged issues reasonably and diplomatically. Must be able to develop and maintain cooperative working relationships. Vacations may be restricted during peak times. Use of computers and other various office equipment is required. All Transportation Engineers hired by Caltrans after May 19, 2000, will be required to participate in the mandatory "Transportation Engineer Rotation Program". The rotation program consists of 9 months Construction work, 9 months Design work, and 6 months in an Elective Assignment(s). The rotation assignment will be based on workload needs and could take place anywhere within the district. The rotation program is a key element in the development of our new employees and allows them to be assimilated into the Caltrans workforce much quicker and to be more productive.

The employee must be able to understand and follow instructions provided, both oral and written, analyze plans and specifications accurately and take effective action. The employee must have the ability to get certified in many of the materials test.

WORK ENVIRONMENT

Job will have exposure to chemicals, equipment, machinery, heat, cold, dust, gas, fumes, chemicals, dirt, lab equipment, construction materials, outdoor conditions, indoor conditions, humidity, and high decibels of noise. Incumbent will have exposure to lab conditions, which may or may not be climate controlled. Hard hat and safety vest or approved safety shirt must be always worn in the field, no exceptions. While at the Construction office employees will normally work in a climate controlled office under artificial light; however, due to periodic problems with the heating and air conditioning, the building temperature may fluctuate. Workload may subject employee to night work, frequent changes of shift, frequent changes of work hours and workdays, and geographic transfer. Travel may be required. Vacations may be restricted during peak times. Overtime may be required.

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

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