

Transportation Engineer (Electrical)

California State Personnel Board Specification

- **Schematic Code:** HJ54
- **Class Code:** 3609
- **Established:** 09/07/1993
- **Revised:** --
- **Title Changed:** --

Definition

This is the entry, first working and journey level of professional electrical, electronic and computer engineering work in Caltrans. At the journey level and with registration, incumbents may act in a responsible charge capacity. Under the direction of a higher level registered engineer, incumbents perform a wide variety of professional electrical and electronic engineering work in either an office or field setting; as incumbents progress in experience they will be assigned more difficult work and may function as a lead person over the activities of various electrical and electronic engineering and technical personnel; and do other related work.

Typical Tasks

Incumbents perform or assist in performing electrical or electronic design, and electrical and electronic construction and maintenance inspections, specification preparation and estimating for highway systems, such as traffic management, signal and lighting and transportation-related facilities (such as movable bridges, drainage pumping plants, vehicular tunnels, safety roadside rest areas, maintenance stations, truck weigh and inspection stations and toll plazas) and associated electrical and electronic systems (such as cathodic and stray current protection, power and power distribution, indoor and outdoor lighting, aids to navigation, and other traffic management and facilities-related electrical and electronic systems) using state-of-the-art technology, i.e., Computer-Aided Drafting/Design (CADD) and personal computers. Some positions may require incumbents to work at considerable heights above the ground.

The Transportation Engineer's (Electrical) assignment within the Department of Transportation will be within one of the three major program areas:

Traffic Operations: Incumbents review traffic and project reports; prepare plans, specifications and estimates of traffic control and highway lighting systems; prepare studies of the physical characteristics of traffic intersections, including channelization, obstructions and potential conflict areas; analyze traffic flow and accident data; prepare timing for new traffic control systems; adjust timing and review the operation of existing traffic control systems; develop strategies and software for traffic control equipment using minicomputers and microprocessors; investigate problems in transportation electrical systems and recommend solutions; inspect and review electrical installations during and after construction; assist in the evaluation and development of new electrical and electronic traffic control and lighting equipment; review and consolidate field reports, prepare contract documents and assist district offices in the preparation of plans, specifications and estimates; prepare correspondence and reports.

Structures: Incumbents review plans and prepare plans, specifications and cost estimates of electrical systems; prepare material lists for electrical layouts and requisitions for the purchase of electrical materials and components; inspect construction, maintenance and repairs; check electrical shop plans and details and contractors' lists of equipment and construction details; test completed work for compliance with contract specifications; as required, may act as a lead worker and review the reports of other Transportation Engineers (Electrical); prepare correspondence and reports.

New Technology: Incumbents prepare research proposals, investigate applications of new technology, conduct research, perform statistical analysis on research data and make recommendations on implementation, and monitor research projects; make engineering studies of current methods of materials testing (including operational requirements and procedures, service demands, equipment needs and cost analysis); perform the design and development of automated data acquisition systems; perform field tests and collect data; perform

design, development and testing of new electronic equipment; may act in a lead capacity for specification compliance testing, research or instrumentation; analyze and evaluate test data and correlate individual test results; make presentations; prepare correspondence and reports.

Minimum Qualifications

EITHER I

Graduation from a four-year curriculum in electrical, electronic or computer engineering accredited by the Accreditation Board for Engineering Technology (ABET). (Registration as a Senior in such a curriculum will admit an application to the competition, but he/she must produce evidence of graduation before he/she will be considered eligible for appointment.) (Possession of a valid certificate as an Engineer-in-Training issued by the California State Board of Registration for Professional Engineers and Land Surveyors, or issued by another jurisdiction and accepted by the California Board in lieu of the first division of the examination as an electrical engineer may be substituted for the required education.)

OR II

Possession of equivalent qualifications may be demonstrated by graduation from an engineering curriculum which includes the basic electrical, electronic and computer engineering courses normally covered in a standard four-year engineering curriculum, and by qualifying in a written examination covering basic electrical and electronic engineering. (Registration as a Senior in such a curriculum will admit an applicant to the qualifying examination, but he/she must produce evidence of graduation before he/she will be considered eligible for appointment.)

OR III

A master's or doctorate degree in an electrical, electronic or computer engineering curriculum from a college or university that has a baccalaureate degree program in an electrical, electronic or computer engineering curriculum which is accredited by Accreditation Board of Engineering Technology (ABET). (Registration as a candidate in such a curriculum will admit an applicant to the competition but he/she must produce evidence of graduation before he/she will be considered eligible for appointment.)

Knowledge and Abilities

Knowledge of: Computer theory and operation, including state-of-the-art technology, e.g., CADD, personal computers, stand-alone interactive systems and various technical aids; mathematics related to electrical engineering; theory principles, standard practices, techniques and methods used in electrical, electronic and computer engineering; modern electrical apparatus, communications, instrumentation; direct and alternating current circuits; methods, materials, tools and equipment used in electrical, electronic or computer work; various codes; basic occupational safety and health regulations governing the design and installation of electrical and electronic equipment, including the National Electric Code and Title 8 Industrial Relations, Electrical Safety Orders of the Division of Occupational Safety and Health.

Ability to: Do electrical or electronic design work; make neat and accurate drawings and technical sketches; use state-of-the-art technology, i.e., CADD, personal computers, stand-alone interactive systems and various technical aids; make electrical calculations; inspect electrical installations; specify necessary equipment and materials; accurately interpret drawings, circuit diagrams and specifications; read and understand highway plans, drawings and field data which relate to transportation and traffic management-related electrical and electronic systems and installations; establish and maintain friendly and cooperative relations with those contacted during the course of inspections and other work; analyze situations accurately and take effective action; communicate effectively; originate correspondence and prepare effective reports.