

SAN BERNARDINO MUNICIPAL WATER DEPARTMENT CLASSIFICATION SPECIFICATION

TITLE: ELECTRICAL AND INSTRUMENTATION TECHNICIAN

DATE: 3/26/2024

JOB CODE: 1085

FLSA STATUS: NON-EXEMPT

UNIT REPRESENTATION: GENERAL

Class specifications are intended to present a descriptive list of the range of duties performed by employees in the class. Specifications are not intended to reflect all duties performed within the job.

DUTIES SUMMARY

Under general supervision, perform a variety of semi-skilled routine electrical and instrumentation work; assist in construction, installation, maintenance, and repair of electrical and instrumentation equipment associated with water and wastewater utilities such as electric motors, generators, electrical panels, switches, regulators, motor operated valve actuators, and lighting systems; assists with inspection, calibration, installation, maintenance, and repair of instruments, controllers, and related equipment; work in and around low voltage (600V or less) panels and circuits; work under the appropriate applicable provisions of the California Electrical Code, approved plans and specifications, and standard industry practices; and perform related work as required.

DISTINGUISHING CHARACTERISTICS

This class is the entry/journey-level technical class in the Electrical and Instrumentation Technician series. This class is distinguished from the Senior level in that incumbents are not responsible for training lower-level personnel, inspecting the work performed by contractors, performing more complex troubleshooting and diagnosis of electric and electronic problems, and developing solutions to complex electric and electronic problems. Supervision is received from a Senior Electrical and Instrumentation Technician, the Electrical and Instrumentation Lead Worker, or the Electrical and Instrumentation Supervisor. This class is distinguished from the Senior level in that incumbents at the senior level work under minimal supervision and possess greater skill and expertise in the operation and maintenance of the Supervisory Control and Data Acquisition (SCADA) system.

EXAMPLES OF DUTIES

The following duties are typical essential duties for positions in this classification. Any single position may not perform all of these duties and/or may perform similar related duties not listed here.

- Provide courteous and expeditious customer service to the general public and City and Department staff;
- Assist in the construction, installation, testing, maintenance, and repair of electrical mechanisms, low-voltage power distribution panels, low-voltage switchgear, motor control centers (MCCs), transformers, switches, electric motors, control panels, power output frequency regulators, solenoids, telemetry, clay valves, automatic control valves (ACVs), voltage controls, low cut-out alarms, geothermal couplers, relays, electronic controls, electronically automated systems, measurement

systems, chlorination monitoring and control systems, and other electrical equipment and apparatuses; work in and around low voltage (600V or less) circuits, panels, and equipment;

- Assist in the routine installation, maintenance, and repair of control circuits, pressure switches, float switches, sensors, underground cables, motors, telemetry copper lines, fiber-optic cables, power output frequency regulators, and transducer recorders;
- Assist in inspecting telemetry equipment, electric controllers, programmable controllers, process meters, flow meters, level controllers, process analyzers, flow systems, and a variety of other types of instrumentation for proper operation;
- Assist in performing installations, repairs, modifications, calibrations, and preventative maintenance on a wide variety of complex digital, analog, programmable, and other auxiliary equipment used in the collection, transmission, and treatment of water and wastewater;
- Assists in performing calibration and maintenance of flow meters, process analyzers, chart recorders, digital recorders, control systems and feed systems, including but not limited to electric, electronic, pneumatic, hydraulic and mechanical equipment; keep accurate maintenance records;
- Make adjustments, repairs, replaces, disassembles, assembles, installs, and tests electrical and electronic apparatuses and instrumentation as directed;
- Read and interpret routine electrical and instrumentation plans, specifications, blueprints, sketches, wiring diagrams, and schematics;
- Assist in pulling, installing, splicing, and terminating wiring; work on cables in underground vaults or from a ladder, aerial boom lift, or aerial lift truck;
- Measure, cut, thread, bend, and install conduit; operate portable power tools commonly used in electrical and instrumentation work;
- Operate and maintain electrical instruments and tools; clean and maintain tools and supplies;
- Assist in testing electrical switchgear, power distribution panels, transformers, circuit breakers, power meters, and other apparatuses; perform routine maintenance of electrical equipment and supplies;
- Assist in estimating time and materials needed to perform various assigned tasks;
- Assist in maintaining an inventory of parts, materials, and supplies used in the electrical instrumentation shop and in performing everyday tasks;
- Assist in documenting and recording all programming, testing, and updates performed;
- Assist in maintaining network communication between equipment, controls, field hardware, and SCADA system;
- Respond to emergency situations during off hours as required;
- Assist other electricians as necessary; direct the work of assigned helpers;
- Routinely adhere to and maintain a positive attitude toward City and Department goals;
- Work effectively with others;
- Required to wear respiratory protective equipment to include Self Contained Breathing Apparatus (SCBA);

- Operate Department vehicles.
- Use a Computerized Maintenance Management System (CMMS) for tracking work orders, data entry, condition assessments, status change, and equipment tracking.

QUALIFICATIONS

Any combination of education, training, and experience that would likely provide the knowledge, skills and abilities to successfully perform in the position is qualifying. A typical combination includes:

Knowledge of:

- Basic electrical, electronics, pneumatics, hydraulics, and mechanics theory, as they apply to equipment commonly found in water and wastewater treatment facilities, wastewater lift stations, and water wells;
- Programmable logic controller (PLC) programming theory at an advanced level for testing, troubleshooting, and repairs of PLC components and data highway systems;
- The California Electrical Code and other applicable codes and regulations;
- Industrial electricity and safety practices, precautions, and procedures;
- Basic tools, materials, methods, and practices of electrical, electronic, and instrumentation trade;
- Methods, materials, and equipment used in chlorine system installation and repair;
- Symbols and standard practices used in the preparation of process and instrument flow diagrams;
- Electrical installations and maintenance in water utility or reclamation facilities, including low voltage (600V or less) electrical circuits;
- Shop mathematics applicable to the electric trade;
- Basic understanding of instrumentation calibration concepts and procedures;
- Basic record-keeping methods;

Ability to:

- Recognize, analyze, and define a variety of routine mechanical, electrical, chlorination, and instrumentation problems with close supervision;
- Assist in correcting instrument operating problems and in making recommendations for system modifications to meet operational needs with close supervision;
- Operate power tools, hand tools, and light equipment used in electrical activities; operate specialized test equipment such as milliamp and millivolt calibrators, multimeters, power supplies, and oscilloscopes;
- Perform a wide range of skilled water utility or reclamation electrical installation, wiring, repair, and maintenance work on low-voltage circuits in accordance with safety standards and policies;
- Read, understand, interpret, and apply moderately complex materials, including technical manuals, drawings, specifications, layouts, diagrams, blueprints, plans, and schematics;

- Keep accurate records;
- Recognize, report, and/or correct unsafe working conditions;
- Understand and carry out routine instructions furnished in oral, written, or diagrammatic form;
- Make simple arithmetical calculations involving fractions, decimals, and percentages with speed and accuracy;
- Effectively use computer systems, software applications relevant to work performed, and modern business equipment to perform various work tasks.
- Respond to call-out or emergencies as required; handle emergency situations as directed;
- Communicate clearly and concisely, both orally and in writing, using appropriate English grammar and syntax;
- Coordinate work assignments with other divisions or sections.
- Establish and maintain effective relationships with those contacted in the course of work;
- Be physically capable of entering permit-required confined spaces and wearing Self Contained Breathing Apparatus (SCBA) equipment;
- Operate an atmospheric tester for entry into confined spaces;
- Wear protective respiratory equipment, including SCBA and personal escape respirator;
- Operate a vehicle observing legal and defensive driving practices;
- Maintain a driving record that meets vehicle code standards and is acceptable to the Department and its insurance carrier;
- Acquire, interpret, and apply Safety Data Sheets (SDS) to identify hazards and select appropriate Personal Protective Equipment (PPE).

MINIMUM QUALIFICATIONS

An employee within this classification may be designated as a “key responder” and as such shall be required to respond to non-normal working hour emergency operational conditions.

Education: High School Diploma or equivalent,
And

Experience: A minimum of two (2) years of full-time experience in installing, maintaining, and/or repairing complex electrical and electronic equipment and devices common to a large waterworks system and wastewater treatment plant or three (3) years of experience in an electrical apprenticeship program.
And

Certificates: Possession of a valid California Class “C” driver’s license required upon application. For out-of-state applicants, a valid driver’s license is required, and a valid California Class “C” driver’s license is required within ten (10) days of appointment (CA Vehicle Code 12505c)

CWEA Electrical Instrumentation certification is desirable.

NECESSARY SPECIAL REQUIREMENTS

Must be able to respond to callouts or emergencies, including being on-call.

Must be clean-shaven or have trimmed facial hair to properly use a personal respirator and SCBA equipment. Must pass a respiratory medical exam and be physically able to wear SCBA equipment. Must be able to work in enclosed spaces while wearing protective clothing under extreme temperatures and hazardous environments.

PHYSICAL TASKS AND ENVIRONMENTAL CONDITIONS

Work involves exposure to potential physical harm, hazardous chemicals, and infectious diseases. There is a frequent need to stand, sit, stoop, walk, and perform other similar actions during the course of the workday. Employee accommodations for physical or mental disabilities will be considered on a case-by-case basis.

Incumbents require sufficient mobility to work in variety of environmental and weather conditions; to climb stairs and ladders daily; to transport materials and supplies weighing up to 100 pounds; to work in a boom truck with a lift of 30 to 60 feet; and to work to heights of 150 feet. Must be able to see in the normal visual range with or without correction. Must be able to hear in the normal audio range with or without correction. Employee accommodations for physical or mental disabilities will be considered on a case-by-case basis.

CAREER LADDER

From: Electrical and Instrumentation Technician

To: Senior Electrical and Instrumentation Technician

Job Description:

Board Approved: (Elect/Instr Tech I):

11/7/2000

Rev:

10/12/2004

Title Chg to Elect/Instr Tech:

12/13/2005

Rev:

10/02/2007

Rev:

03/26/2024

Testing Standards: App Review/Supp App Review