

COMPETENCY MODEL FOR ELECTRICIAN (3863)

The following competencies have been identified as those that best separate superior from satisfactory job performance in the class of **ELECTRICIAN (3863)**. (Numbers refers to the order of the competencies in the Competency Bank.)

- 1. Reading Comprehension**
- 2. Mathematics**
- 3. Judgment and Decision Making**
- 7. Self-Management**
- 8. Safety Focus**
- 24. Mechanical Aptitude**
- 26. Electrical Understanding**
- 43. Follows Oral Directions**

On the following pages are descriptions of each competency, including a definition, the level of the competency required for the class (*italicized, bolded, and underlined*), examples of behavioral indicators, and satisfactory and superior performance levels.

1. READING COMPREHENSION – Comprehends and correctly applies information presented in written form. Makes correct inferences; draws accurate conclusions.

Level of Competency Required by Job:

- Level 1: Concrete, specific job-related information (work orders; instructions; material/equipment labels)
- Level 2: **General information related to field of work and assignments; (articles in trade publications; technical/instructional manuals; memos; letters; e-mails; reports)**
- Level 3: Abstract/complex information (highly technical articles/ reports in specialized area; legal or other regulatory material)

Examples of Behavioral Indicators:

- Follows written instructions correctly.
- Learns information presented in writing.
- Identifies relevant written information.
- Interprets written legal regulatory material accurately.

Performance Levels:

Satisfactory

Reads instructions correctly. Learns from manual and other printed material.

Superior

Learns from manual and may answer others' questions. Explains information presented in written form to others.

2. MATHEMATICS – Performs arithmetic or higher-level mathematical computations accurately.

Level of Competency Required by Job:

Level 1: Perform arithmetic computations (add, subtract, multiply, divide, ratios, percentages).

Level 2: Use algebra (substitute numbers for letters in a formula), geometry (angles, distances, area), and/or descriptive statistics (mean/median/mode, standard deviation, range).

Level 3: Apply and interpret calculus, inferential statistics (t-tests, correlations, ANOVA, multiple regression) or other very high level mathematics.

Examples of Behavioral Indicators:

- Quickly and accurately performs arithmetic computations.
- Appropriately selects and applies formulas for stated purpose.
- Correctly identifies an appropriate analysis for a specific purpose and selects the appropriate computer program for computation.
- Accurately interprets and presents results of mathematical/statistical computations.

Performance Levels:

Satisfactory

Knows mathematical requirements of the job and performs them correctly. Verifies work to ensure accuracy.

Superior

Identifies additional opportunities for the application of mathematics in work. Answers questions/trains others to assist them in their use of mathematics.

3. JUDGMENT AND DECISION MAKING – Accurately assesses situations, seeks new information if necessary, and applies all available information to reach sound conclusions/formulate effective response.

Level of Competency Required by Job:

- Level 1: Training and guidelines needed to respond to immediate situations within very specific function are provided (or supervisor available to assist).
- Level 2: **General information and guidance to assist in responding to a variety of situations across a range of circumstances are provided.**
- Level 3: Little guidance available for responding to a wide range of complex situations with far-reaching and/or enduring consequences.

Examples of Behavioral Indicators:

- Effectively responds to atypical situations.
- Asks questions or otherwise obtains additional relevant information to make a decision.
- Formulates a decision and necessary actions based on available facts.
- Correctly infers appropriate response based on information provided and existing policies, personal experience, and/or consultation with others.
- Discusses conclusions/possible responses with others before taking action as necessary.
- Considers impact of decisions on all affected parties.

Performance Levels:

Satisfactory

Correctly assesses routine and unusual situations and reaches appropriate conclusions for actions needed. Obtains additional information and/or consults with others as necessary.

Superior

Evaluates new situations accurately to establish an appropriate response or plan of action. Recognizes the impact on all affected parties, as well as the possible ramifications and/or repercussions of setting a precedent.

7. SELF MANAGEMENT – Organizes and plans for task accomplishment; manages time and works diligently to complete assigned work/fulfill responsibilities.

Level of Competency Required by Job:

Level 1: Order tasks for efficient performance; maintain awareness of time allotted and deadlines in order to ensure they are met.

Level 2: **Plan and perform work in a way that maximizes efficient performance; establish and adjust priorities to ensure timely completion of most critical assignments.**

Level 3: Allot time to responsibilities proportional to their prominence, priority, and impact.

Examples of Behavioral Indicators:

- Performs only work activities during work hours.
- Alters means of performing work when original approach proves to waste time.
- Keeps a “to do” list (with indication of priority and deadlines, if necessary).
- Requests assistance as necessary when it becomes clear that work will not be completed on time.
- Demonstrates a record of progress with respect to all assignments/responsibilities.
- Uses optimal means of communication for efficiency and effectiveness.

Performance Levels:

Satisfactory

Conducts self while at work in a manner that ensures work will be completed as scheduled, or provides explanation or secures assistance or adjustment of schedule if it will not be.

Superior

Seeks efficiencies in doing work to maximize productivity. Plans work carefully and follows the plan or makes adjustments if it is disrupted. Maintains personal responsibility for all work accomplishment.

8. SAFETY FOCUS – Performs work in a way that minimizes risk of injury to self or others.

Level of Competency Required by Job:

Level 1: Maintain awareness of unsafe conditions and actions to avoid injury.

Level 2: Follow safety rules/procedures; avoid known hazards in the work environment.

Level 3: Carefully follow safety rules and procedures and consistently use all necessary safety equipment.

Examples of Behavioral Indicators:

- Wears seat belt.
- Ensures safe physical work environment by taking actions such as eliminating unstable stacks of materials, closing drawers so filing cabinets will not tip over, and keeping pathways clear of tripping hazards.
- Reviews safety procedures before beginning each job with known hazards.
- Follows safety procedures while performing work even when it takes more time.
- Uses safety equipment such as goggles, gloves, and earplugs as required or warranted.
- Frequently checks safety equipment for proper condition and operation.

Performance Levels:

Satisfactory

Maintains awareness of personal safety to avoid injury or property damage during all work activities.

Superior

“Safety first.” Places avoidance of injury or property damage above all other job requirements. Mentions the need to follow safe work practices to co-workers. Actively seeks ways to avoid injury.

Safety Focus Areas

1. Knowledge of how to establish electrically safe work conditions when working on electrical circuits, including but not limited to, lockout/tagout, confirming that the line is de-energized, erecting proper barriers or barricades, standard lifting procedures, and properly setting up or taking down ladders, sufficient to minimize the chances of injury to self, other employees, and/or the public.
2. Knowledge of various types of personal protective equipment (PPE) and their use, such as fire-rated (FR) clothing, voltage rated gloves, voltage rated hard hat, protective eyewear, appropriate footwear, ear protection, insulated tools, insulated barriers, and protective grounding equipment, sufficient to minimize the chances of injury to self, other employees, and/or the public.
3. Knowledge of emergency first aid procedures, such as performing cardio pulmonary resuscitation (CPR), using an automatic external defibrillator (AED), and assisting with on-the-job injuries, including cuts, electrical shocks, abrasions, and punctures, sufficient to ensure that injuries are mitigated.
4. Knowledge of the harmful effects of hazardous or toxic materials and fumes (e.g., asbestos, lead, methane) as described in Safety Data Sheets (SDSs) and the necessary safeguards for protection sufficient to take proper care in handling these materials when needed.
5. Knowledge of Cal/OSHA Title 8 General Safety Orders, Electrical Safety in the Workplace (NFPA 70E), and Departmental operating procedures as they pertain to working near potentially dangerous conditions, such as high lines in a bucket truck, rotating electrical machinery, open electrical conductors, and/or energized and de-energized equipment, sufficient to ensure safety of self, others, and/or the public.
6. Knowledge of safe driving rules and regulations, such as those found in the California Vehicle Code, sufficient to operate trucks, vans, trailers, and other specialized vehicles in a safe manner.

24. MECHANICAL APTITUDE – Accurately predicts the impact of forces on objects and assesses the behavior of other physical phenomena (e.g., volume, weight, velocity). Readily learns work involving the application of mechanical principles.

Level of Competency Required by Job:

- Level 1: Maintain a safe work environment by ensuring objects in it are stable, tools and equipment are properly used.
- Level 2: **Know the physical properties of objects in the work environment and correctly anticipate the action of forces upon them; performs work accordingly (correctly and safely).**
- Level 3: In-depth understanding of mechanical and physical phenomena sufficient to design and/or oversee the construction of systems.

Examples of Behavioral Indicators:

- Recognizes the impact of an earthquake on objects in the work environment and re-arranges them as possible to avoid possible damage or destruction and potential to cause injury.
- Uses tools properly to accomplish work correctly and safely.
- Recognizes the effects of various actions on objects and performs only those actions that will accomplish intended result and will not cause property damage or injury.
- Systems designed and/or for which construction is overseen operate as intended upon completion.

Performance Levels:

Satisfactory

Recognizes the operation of mechanical/physical phenomena sufficient to readily learn and perform work of a mechanical nature.

Superior

Displays exceptional insight into the operation of mechanical phenomena, and makes correct inferences regarding it. Promptly and accurately troubleshoots problems.

Mechanical Aptitude Areas

1. Knowledge of the tools, equipment, and instruments necessary for installation, repair, or replacement of electrical systems, such as hand tools (e.g., wrenches, screwdrivers, pry bars, hammers, chisels, pliers, wire cutters, strippers, saws, levels, rulers, drills, benders, fishtape, cable cutters, hand crimpers, knives), power tools (e.g., electric drills, hammer drills, saws, threaders, conduit benders, winches, pullers, cutters, crimpers), and/or hydraulic tools (e.g., benders, cutters, crimpers, presses), powder actuated fastening tools (e.g., nails, screws, anchors, conduit straps), and gauges, sufficient to maintain systems or equipment safely and test systems, equipment, or devices properly.
2. Knowledge of the methods or procedures used to repair damaged or defective electrical devices, systems, or equipment, such as cleaning, adjusting, lubricating, tightening, or replacing components or wiring, sufficient to return these systems or equipment to working condition.

26. ELECTRICAL UNDERSTANDING – Comprehends the concept and the operation of flow of electrical current.

Level of Competency Required by Job:

Level 1: Know the properties of electricity relevant to the work environment and work to be performed in order to correctly perform work and recognize hazards that will be created by the failure to do so.

Level 2: Sufficient understanding of electricity to recognize problems and determine repair needed to prevent disaster/restore operation.

Level 3: *In-depth understanding of electrical principles and phenomena sufficient to design and/or oversee the installation of complex electrical systems.*

Examples of Behavioral Indicators:

- Ensures safe physical work environment by taking actions such as eliminating exposed electrical wire, faulty connections, empty sockets, and overloaded circuits.
- Recognizes the danger of fire from faulty electrical installations.
- Uses tools, equipment, and instruments properly to accomplish electrical work correctly and safely.
- Systems designed and/or for which installation is overseen perform as intended upon completion.

Performance Levels:

Satisfactory

Understands the operation of electricity sufficient to readily learn and perform electrical work.

Superior

Displays exceptional insight into the operation of electrical systems, and makes correct inferences regarding them. Promptly and accurately troubleshoots problem.

Electrical Understanding Areas

1. Knowledge of the fundamental principles and laws of electricity, such as alternating current (AC) and direct current (DC), sufficient to understand testing procedures, prevent personal injury, and ensure safe work habits when working on electrical circuits.
2. Knowledge of electrical formulas and units of measure, such as current, voltage, resistance, impedance, reactance, and power, sufficient to calculate loads, current, power demand, power quality, and power factors.
3. Knowledge of electrical circuitry, such as series and parallel circuits, motor windings and connections, transformer windings and connections, and motor control circuitry, sufficient to properly connect, install, test, and troubleshoot electrical systems.
4. Knowledge of the applications, characteristics, and installation of wiring methods and materials used in new and existing electrical systems, including but not limited to, lighting systems, fire life safety systems, raceways, wiring, panel boards, pull boxes, branch circuits, circuit breakers, motor controllers, electric vehicle infrastructure, and photovoltaic systems, sufficient to determine and select the most appropriate cost effective material for the job.
5. Knowledge of the National, State, and local electrical codes, such as the National Electrical Code, California Electrical Code, and Los Angeles Electrical Code, and specifications sufficient to interpret and apply requirements for electrical installations.
6. Knowledge of the causes of and solutions to electrical system failures or malfunctions, such as open conditions, short circuits, ground faults, proper torqueing, dirty contacts, loose pins, dissimilar metals, and open coils, sufficient to determine how a system should be returned to service.
7. Knowledge of the basic components and functions of transformers and motors, such as cores, coils, terminals, tap changers, rotors, stators, frames, end bells, bearings, commutators, brushes, armatures, slip rings, and wiring diagrams, sufficient to identify areas in need of repair.
8. Knowledge of the different types, installation methods, and repair of electrical infrastructure, such as diagnostics, recording, testing, wire pulling, wire splicing, wire termination, conduit bending, fabrication, and rigging, sufficient to facilitate the installation of conductors and ensure proper electrical connections for voltages normally 600V or below.
9. Knowledge of federal, state, or local regulations related to the installation and repair of electrical equipment, such as Federal Aviation Administration (FAA) Advisory Circulars pertaining to high voltage runway, taxiway circuits, high voltage distribution systems, and Los Angeles Fire Department Regulation 4 pertaining to electrical systems, sufficient to comply with necessary requirements. (LAWA)
10. Knowledge of the operation and procedures used in the maintenance and repair of uninterruptible power supply (UPS) systems, generators, battery systems, electric

vehicle infrastructure, photovoltaic systems, control and sensor devices, and variable frequency drives, such as recommended service requirements and preventative maintenance schedules, sufficient to analyze, troubleshoot, replace, or repair defective components and maintain proper systems operation.

11. Knowledge of terminology and symbols used in electrical work, such as those found in building plans, blueprints, electrical drawings, schematic diagrams, and wiring diagrams, sufficient to understand assignments, communicate with coworkers and supervisors, identify electrical circuits, devices, and equipment, and determine what needs to be done.

43. FOLLOW ORAL DIRECTIONS – Performs work accurately as directed orally.

Level of Competency Required by Job:

- Level 1: Receive specific, complete oral directions daily or by individual task assignment throughout the day.
- Level 2: **Receive general instructions orally that span across days or for entire assignments.**
- Level 3: Receive general instructions/assignments orally regarding long-term objectives/responsibilities.

Examples of Behavioral Indicators:

- Does work assigned orally properly and on time.
- Asks pertinent questions for clarification of assignments.
- Performs work correctly when instructions were given orally.
- Explains assignments to others who received the same instructions.
- Performs work in accordance with general outline provided orally.
- Correctly infers details of assignments given only in general terms.

Performance Levels:

Satisfactory

Properly performs work when concrete, specific instructions are given orally. Asks pertinent questions when parts of the instructions are unclear or omitted.

Superior

Properly performs work assigned orally. Answers questions or explains work to others. Correctly infers details or portions of instructions that were omitted.