COMPETENCY MODEL FOR
ELECTRICAL REPAIRER
CLASS CODE 3853 (2024)

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

2. Mathematics
8. Safety Focus
10. Physical Capability
20. Job Knowledge
24. Mechanical Aptitude
26. Electrical Understanding
33. Interpersonal Skills
35. Teamwork
44. Follow Written 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 level.

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.

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 the procedures and materials utilized to clean windings, coils, and switches of various electrical components, such as referencing Safety Data Sheets (SDS) and using contact cleaners, solvents, and detergents, sufficient to avoid damage to equipment, injury to oneself and others, and to maintain proper functioning equipment.

2. Knowledge of methods, stress limits, and equipment used in moving and hoisting heavy equipment, such as proper working positions and lifting practices, identification of weight restrictions, and the use of heavy duty moving equipment sufficient to prevent damage to property and injury to oneself and others.

3. Knowledge of hazards relating to electrical repair work and Cal/OSHA and departmental safety regulations and precautions, such as working on or near live or exposed circuits, in adverse weather conditions and confined spaces, on aerial equipment or scaffolding, with rotating equipment, the use of Personal Protective Equipment (PPE), insulated barriers, and caution tape, lock-out/tag out procedures, and adherence to departmental operating orders (OO), sufficient to avoid damage to electrical equipment and to protect oneself and others from injury.

4. Knowledge of practices and procedures relating to first aid and cardiopulmonary resuscitation (CPR), such as proper burn, dismemberment, heat stroke/stress, bone fracture, fall, and electrical shock procedures, sufficient to render temporary aid to employees or others.

10. PHYSICAL CAPABILITY – Strength, endurance, flexibility, and/or coordination.

Level of Competency Required by Job:

Level 1: Sitting and/or standing for extended periods of time.

Level 2: Awkward body position and/or precise motions required; and/or repeated lifting, carrying, and/or manipulation of objects; and/or walking for extended periods of time.

Level 3: Continuous or extreme exertion of physical effort.

Examples of Behavioral Indicators:

- Sits and may occasionally stand or walk for entire workday (except breaks).
- Walks for the duration of the workday.
- Repetitive motion required to perform task.
- Repeatedly lifts and carries heavy objects.
- Exerts maximal effort for extended periods of time.

Performance Levels:

Satisfactory

Performs tasks requiring physical capability satisfactorily and without undue physical stress or harm.

Superior

Performs tasks requiring physical capability correctly with relative ease. May be asked to perform the most physically demanding tasks or be sought by co-workers for assistance.

20. JOB KNOWLEDGE – Knows information required to perform a specific job. Includes both widely available courses of study (for example, chemistry, human resources management, graphic arts) and City-specific information (parking regulation and ticketing practices; purchasing procedures; provisions of the City Charter).

Level of Competency Required by Job:

Level 1: Knowledge is concrete, factual, and/or procedural and may be defined by the organization. Situations in which it is applied are quite consistent.

Level 2: Knowledge is substantive and may be defined by an external trade, field, or profession. Situations in which it is applied vary and, as such, require breadth and depth of understanding.

Level 3: Knowledge is abstract, conceptual, and/or complex and may be supported by a well-defined academic discipline or authoritative sources (e.g., laws, ordinances, government guidelines/regulations/codes). Situations in which it is applied may vary greatly or be novel.

Examples of Behavioral Indicators:

- Performs work correctly/avoids technical (job content related) errors. Answers technical questions about work accurately.
- Asks few technical questions about the performance of routine work activities.
- Offers advice ("coaching") to new employees regarding their work.
- Develops training programs for other employees.
- Sought out as a source of information by others.

Performance Levels:

Satisfactory

Sufficient job knowledge to perform work correctly independently. Answers technical questions about work correctly.

Superior

Expertise in technical job information sufficient to serve as a resource to others. May develop training manuals/ programs and/or give internal and/or external presentations related to work.

Job Knowledge Areas

1. Knowledge of electrical and mechanical characteristics of electric equipment, including their internal functioning and connection, such as pumps, turning gears, fans, motors, generators, cranes, and various rotating equipment, sufficient to identify problems within the equipment and make repairs as necessary at various locations such as steam/gas power generating plants, hydro-electric power plants, and electrical substations.

2. Knowledge of the installation and operation of basic electrical wiring circuits, such as fire protection equipment, battery banks, motor controls, and building and lighting circuits, sufficient to safely install and operate electrical equipment.

3. Knowledge of the commonly used tools and equipment of the electrical repairing trade, such as multimeters or VOMs (volt-ohm-milliammeter), meggers, ammeters, grinders, lathes, drills, presses, shears, lineman pliers, hacksaws, wrench sets, screwdrivers, tape measurers, calipers, and micrometers, sufficient to safely and properly use them to repair and provide preventative maintenance to electrical equipment.

4. Knowledge of the techniques and procedures of brazing and soldering of electrical connections as it relates to electrical equipment, such as oxy-acetylene and SIL-FOS, sufficient to connect coils and motor, generator, and transformer windings and to repair electrical equipment.

5. Knowledge of the techniques and procedures involved in disassembly, reassembly, installation, repair modification, overhaul, rewinding, and rebuilding of utility electrical and hydraulic equipment, such as reviewing as-found and as-left reads, sufficient to repair equipment and put it back into operation.

6. Knowledge of inspection and testing procedures, such as reviewing Original Equipment Manufacturer (OEM) manuals, communicating with Engineering Departments, taking quality assurance (QA) readings, and conducting insulation, continuity, performance, vibration, and alignment testing, sufficient to conform to departmental standards and to determine the extent of damage and wear on electrical equipment.

7. Knowledge of advanced hand tool identification such as small wrenches, drills, and saws sufficient to recognize and safely utilize equipment.

8. Knowledge of basic tool identification of power tools including hydraulic equipment (hydraulic press), band saw, and mill and lathe sufficient to recognize equipment and understand its purpose.

9. Knowledge of fundamental rigging practices and lifting techniques including equipment involved in rigging such as hoist, slings, or eye bolts sufficient to safely lift or move large objects.

10. Knowledge of fundamental mobile and aerial lifting equipment such as forklifts or manlifts sufficient to safely operate the equipment.

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	Superior
Recognizes the operation of mechanical/physical phenomena sufficient to readily learn and perform work of a mechanical nature.	Displays exceptional insight into the operation of mechanical phenomena, and makes correct inferences regarding it. Promptly and accurately troubleshoots problems.

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Mechanical Aptitude Areas

1. Knowledge of fundamental mechanical advantages such as levers, pry bars, pulleys, ropes, and fulcrums sufficient to visualize the action and utilize mechanical devices.
2. Knowledge of gear trains, gearboxes, and directions of rotation for devices that are related to ropes and pulleys sufficient to visualize the action and utilize mechanical devices.
3. Knowledge of visualization of outcome of complex machinery or systems sufficient to visualize the action and utilize mechanical devices.

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.

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 fundamentals of electricity and electronics as they relate to electrical repair work, such as Ohm's Law in circuitry, for troubleshooting, and preventative maintenance, sufficient to identify problems within the electrical equipment and make repairs as necessary.
2. Knowledge of standards related to the preparation of working sketches of tools and component parts of equipment, such as the use of print symbols and keys or legends, sufficient to provide clear instructions and guidance in the proper disassembly, reassembly, and troubleshooting of electrical equipment.
3. Knowledge of electrical diagrams and drawings, sufficient to read and interpret them for use in the repair and maintenance of electrical equipment.
4. Knowledge of specifications related to electrical equipment, sufficient to properly install, repair, and modify equipment.

33. INTERPERSONAL SKILLS – Interacts effectively and courteously with others.

Level of Competency Required by Job:

Level 1: Interact with members of the workgroup, supervision, and/or the public in a cordial, service-oriented manner.

Level 2: Interact across department lines and with appointed City officials, and/or members of the public, at times under adversarial circumstances, in a cordial, respectful manner.

Level 3: Interact with appointed and elected City officials, department heads, representatives of external organizations, and/or the media ina cordial, effective manner.

Examples of Behavioral Indicators:

- Works well with others toward mutual objectives.
- Does not arouse hostility in others.
- "Disagrees without being disagreeable."
- Elicits acceptance/cooperation from others.
- Affords all individuals respect, regardless of their role or status.
- Effectively addresses concerns of politicians or others who may have their "own agenda."

Performance Levels:

Satisfactory

Behaves in a courteous, respectful, cooperative manner toward co-workers, other City employees, and members of the public.

Superior

Facilitates positive interpersonal relations within/among workgroups and toward members of the public. Adept at finding similarities and grounds for cooperation/mutual benefit.

35. TEAMWORK – Interacts effectively with others to achieve mutual objectives; readily offers assistance to others to facilitate their goal accomplishment.

Level of Competency Required by Job:

Level 1: Work effectively as a member of a work unit or project team. Readily offer assistance to others when they have too much work or have too little.

Level 2: Work effectively as a team member in which different people have different roles/responsibilities and perspectives. Identify points for collaboration with co-workers; readily offer and request assistance.

Level 3: Work effectively as a part of an interdependent team (your work gets done only if the work of the whole team is done; evaluation of team performance is more relevant than individual performance).

Examples of Behavioral Indicators:

- Discusses work-related matters with co-workers.
- Offers and requests assistance readily.
- Offers and is receptive to suggestions.
- Identifies problems with workflow that will prevent team from accomplishing its goals.
- Provides constructive criticism and feedback to team members to improve overall functioning of team.
- Assigns credit to team for accomplishments.

Performance Levels:

Satisfactory	Superior
Cooperates with co-workers and fulfills responsibilities as a member of a project team. Maintains a focus on common objectives and offers and requests assistance readily.	Sees the team as a whole; acknowledges that performance of the team is what in reality is evaluated by others. If anyone fails, everyone on the team fails.

44. FOLLOW WRITTEN DIRECTIONS – Performs work accurately as directed in writing.

Level of Competency Required by Job:

Level 1: Perform tasks assigned in writing.

Level 2: Perform work after reading instructional manual.

Level 3: Perform work after completion of training modules or programs presented in writing.

Examples of Behavioral Indicators:

- Correctly completes work assigned in writing.
- Answers questions and/or explains work to others who received the same instructions.
- Learns and applies information presented in writing (instruction manual; training program).
- Correctly infers details of work to be performed that were unclear or omitted as presented in writing.

Performance Levels:

Satisfactory	Superior
Correctly performs work assigned or for which training was provided in writing.	Understands instructions and training materials presented in writing to the extent that is able to answer questions or explain to others. Correctly infers unclear or omitted details as presented in writing.