

## **Traffic Operations Electrician**

### **SUMMARY/PURPOSE**

This classification works to ensure the dependability and functionality of traffic signals and street lighting for efficient vehicle flow and public safety on public thoroughfares. To perform highly technical work in the installation, repair, operation, and maintenance of electrical, electronic and digital controlled traffic control devices and systems, traffic signal equipment, street lighting equipment, traffic computer equipment, traffic network equipment, and control software.

### **SUPERVISION RECEIVED**

For both one-of-a-kind and repetitive tasks, the supervisor makes specific assignments that are accompanied by clear, detailed, and specific instructions. Incumbents work as instructed and consult with the supervisor.

### **SUPERVISION GIVEN**

Does not supervise.

### **ESSENTIAL DUTIES AND RESPONSIBILITIES**

1. Program, install, maintain, and repair traffic control devices and systems, including traffic signals, control cabinets, signal heads, inductive detectors, wireless detectors, communication cable, fiber optics, machine vision processors, speed reader boards, and related devices within the City of Duluth and surrounding municipalities.
2. Program, install, maintain, and repair the City's emergency pre-emption system.
3. Test traffic control and signal equipment and related devices to identify defects in electric, analog, electronic, digital, and microprocessor equipment according to system schematics.
4. Program, install, maintain, and repair various types of traffic signal controller units and associated system components and control and/or associated monitoring equipment.
5. Install, maintain, and repair citywide traffic supervisory control and data acquisition system communications and networks including, but not limited to, radio including wireless, fiber optics, and twisted pair.
6. Program, install, maintain, and repair street lighting devices and systems including control cabinets and all associated infrastructure.
7. Identify, locate, and mark City underground electrical utilities in accordance with Minnesota "Gopher State One Call" requirements.
8. Inspect the work of contractors for proper operation and to ensure contract specifications are met.
9. Be an effective team member by exhibiting self-motivation, supporting other employees in handling tasks, interacting effectively and respectfully with others, showing a desire to contribute to the team effort, accepting assignments willingly, and completing tasks within agreed upon timelines.
10. Other duties may be assigned.

### **JOB REQUIREMENTS**

To perform this job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed are representative of the knowledge, skills, and abilities required.

1. Education & Experience Requirements
  - A. Associate's Degree in electrical or electronics technology; OR two (2) years of experience working with electronic and electrical signal systems as a Class A Journeyman Electrician.
2. License Requirements
  - A. Possession of a valid Minnesota Driver's License or equivalent.
  - B. Possession of a State of Minnesota Class A Journeyman Electrician's License.
  - C. Acquire a Minnesota Class B Commercial Driver's License within 12 months of hire date.
  - D. Acquire State of Minnesota Technical Certification for Signals & Lighting within 12 months of hire date.

3. Knowledge Requirements

- A. Extensive knowledge of the principles, methods, equipment, and materials used in the repair of electronic and electrical signal systems.
- B. Extensive knowledge of electronic theory and practice, including solid state and digital electronics.
- C. Knowledge of the National Electrical Code.
- D. Knowledge of state and local regulations governing electrical wiring.
- E. Knowledge of principles and applications of traffic work zone safety equipment.
- F. Knowledge of problem-solving and conflict-resolution techniques.
- G. Knowledge of applicable safety requirements.
- H. Knowledge of precautionary, safety, and fire prevention methods involved in electrical work.
- I. Knowledge of, or the ability to learn, City policies and procedures.

4. Skill Requirements

- A. Skill in the operation of office equipment including, but not limited to, general computer systems, job required software applications, the internet, and modern office equipment.
- B. Skill in managing one's own time.
- C. Skill in completing assignments accurately and with attention to detail.
- D. Skill in diagnosing, maintaining, and repairing diverse electronic and electrical equipment at the component level.
- E. Skill in diagnosing and repairing electrical and electronic malfunctions, which includes the use of electronic test equipment and soldering stations for soldering/desoldering Large Scale Integrated Circuits (LSICs) and Surface Mount Devices (SMDs).
- F. Skill in the use of computer equipment to control, program, and diagnose equipment.
- G. Skill in reading and interpreting blueprints and schematic drawings.

5. Ability Requirements

- A. Ability to create and maintain a positive working environment that welcomes diversity, ensures cooperation, and promotes respect by sharing expertise with team members, fostering safe work practices, and developing trusting work relationships.
- B. Ability to communicate and interact effectively with members of the public.
- C. Ability to communicate effectively both orally and in writing.
- D. Ability to understand and follow instructions.
- E. Ability to problem-solve a variety of situations.
- F. Ability to set priorities and complete assignments on time.
- G. Ability to attend work as scheduled and/or required.

Physical Demands

The work requires considerable and strenuous physical exertion such as frequent climbing of tall ladders, lifting heavy objects over 50 pounds, crouching or crawling in restricted areas.

Work Environment

The work environment involves high risks with exposure to potentially dangerous situations or unusual environmental stress requiring a range of safety and other precautions (e.g., working at great heights under extreme outdoor weather conditions, or in similar situations in which conditions cannot be controlled).

HR: MS	Union: Basic	EEOC: Skilled Craft Workers	CSB: 06/08/2022	Class No: 4226
WC: 5506	Pay:	EEOF: Utilities/Transportation	CC:	Resolution:

## **SIGNAL TECHNICIAN**

### **Traffic Operations Electrician**

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#### **SUPERVISION RECEIVED**

For both one-of-a-kind and repetitive tasks, the supervisor makes specific assignments that are accompanied by clear, detailed, and specific instructions. Incumbents work as instructed and consult with the supervisor.

#### **SUPERVISION GIVEN**

Does not supervise.

#### **ESSENTIAL DUTIES AND RESPONSIBILITIES (other duties may be assigned):**

1. Program, install, maintain, and repair traffic control devices and systems, including traffic signals, control cabinets, signal heads, inductive detectors, wireless detectors, communication cable, fiber optics, machine vision processors, speed reader boards, and related devices within the City of Duluth and surrounding municipalities.
2. Program, install, maintain, and repair the City's emergency pre-emption system.
3. Test traffic control and signal equipment and related devices to identify defects in electric, analog, electronic, digital, and microprocessor equipment according to system schematics.
4. Program, install, maintain, and repair various types of traffic signal controller units and associated system components and control and/or associated monitoring equipment.
5. Install, maintain, and repair ~~city-wide~~citywide traffic supervisory control and data acquisition system communications and networks including, but not limited to, radio including wireless, fiber optics, and twisted pair.
6. Program, install, maintain, and repair street lighting devices and systems, including control cabinets and all associated infrastructure.
7. Identify, locate, and mark City underground electrical utilities in accordance with Minnesota "Gopher State One Call" requirements.
8. Inspect the work of contractors for proper operation and to ensure contract specifications are met.
9. ~~Investigate and respond appropriately to citizen input, inquiries, and complaints.~~
10. ~~Clean, organize, and maintain work areas, vehicles, tools and equipment.~~
11. ~~Testify in court as required.~~

#### **Job Requirements**

9. Be an effective team member by exhibiting self-motivation, supporting other employees in handling tasks, interacting effectively and respectfully with others, showing a desire to contribute to the team effort, accepting assignments willingly, and completing tasks within agreed upon timelines.
10. Other duties may be assigned.

#### **JOB REQUIREMENTS**

To perform this job successfully, an individual must be able to perform each essential duty satisfactorily. The requirements listed ~~below~~ are representative of the knowledge, skills, and abilities required.

1. Education & Experience Requirements

- ~~1.A. Two~~ Associate's Degree in electrical or electronics technology; OR two (2) years of experience working with electronic and electrical signal systems as a Class A Journeyman Electrician.
- ~~2. A two-year degree in electrical or electronic technology is preferred.~~
2. License Requirements
  - ~~1.A.~~ Possession of a valid Minnesota Driver's License or equivalent.
  - ~~2.B.~~ Possession of a State of Minnesota Class A Journeyman Electrician's License.
  - ~~3.C.~~ Acquire a Minnesota Class B Commercial Driver's License within ~~twelve (12)~~ months of hire date.
  - ~~4.D.~~ Acquire State of Minnesota Technical Certification for Signals & Lighting within ~~twelve (12)~~ months of hire date.
3. Knowledge Requirements
  - ~~1.A.~~ Extensive knowledge of the principles, methods, equipment, and materials used in the repair of electronic and electrical signal systems.
  - ~~2.B.~~ Extensive knowledge of electronic theory and practice, including solid state and digital electronics.~~3. Knowledge of mathematics at an advanced algebraic and trigonometric level.~~
  - ~~4.C.~~ Knowledge of the National Electrical Code.
  - ~~5.D.~~ Knowledge of state and local regulations governing electrical wiring.
  - E. Knowledge of principles and applications of traffic work zone safety equipment.
  - F. Knowledge of problem-solving and conflict-resolution techniques.
  - G. Knowledge of applicable safety requirements.
  - ~~6.H.~~ Knowledge of precautionary, safety, and fire prevention methods involved in electrical work.
  - ~~7.I.~~ Knowledge of ~~applicable safety regulations.~~, or the ability to learn, City policies and procedures.
4. Skill Requirements
  - A. Skill in the operation of office equipment including, but not limited to, general computer systems, job required software applications, the internet, and modern office equipment.
  - B. Skill in managing one's own time.
  - C. Skill in completing assignments accurately and with attention to detail.
  - ~~1.D.~~ Skill in diagnosing, maintaining, and repairing diverse electronic and electrical equipment at the component level.~~2. Skill in communicating with others to determine the nature of equipment malfunction and assist with problem diagnosis.~~
  - ~~3.E.~~ Skill in diagnosing and repairing electrical and electronic malfunctions, which includes the use of electronic test equipment and soldering stations for soldering/desoldering ~~LSICs~~ (Large Scale Integrated Circuits (LSICs) and ~~SMDs~~ (Surface Mount Devices (SMDs)).
  - ~~4.F.~~ Skill in the use of computer equipment to control, program, and diagnose equipment.~~5. Skill in manipulating tools and equipment using fine hand movements.~~~~6. Skill in performing mathematical calculations to compute ampacity, traffic flow rates and density, etc.~~
  - ~~7.G.~~ Skill in reading and interpreting blueprints and schematic drawings.
5. Ability Requirements
  - ~~1. Ability to work outside year-around.~~
  - ~~2. Ability to work from ladders, scaffolds, and lifts up to 50 feet high.~~
  - ~~3. Ability to use hand and power tools.~~
    - A. Ability to establish~~create~~ and maintain effective~~a positive~~ working environment that welcomes diversity, ensures cooperation, and promotes respect by sharing expertise with team members, fostering safe work practices, and developing trusting work relationships.
  - ~~4.B.~~ Ability to communicate and interact effectively with co-workers, supervisors, and members of the general public.

- ~~5-C. Ability to make repairs on electrical equipment in writing.~~  
~~6-D. Ability to do light welding.~~  
~~7-E. Ability to safely operate service vehicles.~~  
8. Ability to work on-call after completion of regular assigned work hours.  
9. Ability to work independently without direct supervision.  
10. Ability to plan, set up, and maintain work zone traffic control.  
11. Ability to use traffic simulation priorities and modeling software such as SimTraffic.  
12. Ability to use traffic management software such as Syncro.  
13. Ability to use wireless traffic detection software such as Sensys.  
14. Ability to use computer-aided design software such as Autodesk AutoCAD.

### Physical Ability Requirements

1. Ability to feel to perceive temperature fluctuations caused by equipment malfunction.  
2. Ability to smell to distinguish overheated or burned-out components, often by type of component.  
3. Ability to work in confined spaces.  
4. Ability to frequently stand, reach, and finger and occasionally walk, sit, push, pull, climb, balance, stoop, kneel, crouch, handle, feel, talk, hear, and smell as needed to perform work activities.  
5. Ability to frequently see at near and mid distances using color vision to diagnose and repair electronic and electrical equipment and to occasionally see at far distances using depth perception and visual accommodation and field of vision to observe equipment function and for vehicle operation.  
~~6-F. Ability to frequently lift and carry various items including tools boxes weighing up to 40 pounds and occasionally lift and carry with assistance street lighting light poles weighing up to 70 pounds.~~  
7-G. Ability to attend work on a regular basis as scheduled and/or required.

### Physical Demands

The work requires considerable and strenuous physical exertion such as frequent climbing of tall ladders, lifting heavy objects over 50 pounds, crouching or crawling in restricted areas.

### Work Environment

The work environment involves high risks with exposure to potentially dangerous situations or unusual environmental stress requiring a range of safety and other precautions (e.g., working at great heights under extreme outdoor weather conditions, or in similar situations in which conditions cannot be controlled).

HR: <del>GTMS</del>	Union: Basic	EEOC: Skilled Craft Workers	CSB: <del>09/03/2013</del>	Class No: 4226
WC: 5506	Pay: <del>34</del>	EEOF: Utilities/Transportation	CC: <del>09/09/2013</del>	Resolution: <del>13-0469R</del>