

## **Engineering Technician**

### SUMMARY/PURPOSE

To perform technical engineering work related to the design, survey, construction, and inspection of street, bridge, traffic, and utility infrastructure systems including water, gas, sanitary sewer, and storm sewer.

### 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. Gather preliminary topographic surveys.
2. Provide contractors with construction control, stakes, and information required to construct public improvements.
3. Operate and maintain survey and Global Positioning System (GPS) equipment to obtain accurate survey measurements and point locations.
4. Process survey information, including computer data entry work.
5. Prepare graphic representations of Geographic Information Systems (GIS) using GIS software, review existing GIS data for accuracy, quality, and completeness, and add/or modify existing GIS databases.
6. Create roadway and public infrastructure improvement plans using Autodesk software, preliminary designs, quantity takeoffs, cost estimates, and prepare engineering reports and related studies to assist in the planning and implementation of public infrastructure projects.
7. Prepare bidding documents for public roads, trails, utilities, and other public infrastructure improvements.
8. Perform construction administration and on-site inspection to ensure that all work is constructed in conformance with the plans, specifications, and industry standards.
9. Maintain accurate recordkeeping, including daily log of construction activities, progress reports, measurements of quantities and pay items, change orders, and other documentation and reports as associated with city, municipal state aid, and/or federal aid funded projects.
10. Prepare record drawings.
11. Act as a liaison between the public, business community, contractors, and City Administration.
12. Locate underground utilities including water, gas, sanitary sewer, and storm sewer systems.
13. Investigate complaints, inquiries, and requests.
14. Study and report findings, conclusions, and recommendations in oral and/or written form.
15. Review construction plans and specifications for compliance with City standards.
16. Maintain, revise, and research manual or computer records.
17. Coordinate work activities with contractors, outside agencies, other City personnel, and property owners.
18. Assist a certified MnDOT Team Leader in completing Bridge Safety inspections of the City's bridge inventory.
19. Act as a competent person and/or incident commander during emergency situations.
20. 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.
21. 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 Civil Engineering Technology or a related professional field, and two (2) years of related professional experience in a position within the engineering field; OR a minimum of four (4) years of related education and/or full-time, verifiable professional work experience in a position within the engineering field.
  
2. License & Certification Requirements
  - A. Possess and maintain a valid Minnesota Class D driver's license or privilege.
  - B. Must obtain and maintain current Minnesota Department of Transportation (MnDOT) certifications for Bituminous, Concrete and Aggregate within two (2) years of date of hire.
  - C. Must obtain and maintain natural gas Operator Qualifications (OQs) within one (1) year of date of hire.
  - D. Must obtain and maintain Minnesota Erosion and Stormwater Management Certification as required within one (1) year of date of hire.
  - E. Must obtain and maintain MnDOT ADA sidewalk certification within one (1) year of date of hire.
  - F. Bridge Construction, Bridge Inspection, and Signal and Lighting certifications may be required by supervisor.
  
3. Knowledge Requirements
  - A. Knowledge of algebra, geometry, and trigonometry.
  - B. Knowledge of technical engineering principles and practices.
  - C. Knowledge of the principles, methods, equipment, and materials used in construction of streets, bridges, traffic, and utility infrastructure systems including water, gas, sanitary sewer, storm sewer, and various public works structures.
  - D. Knowledge of the principles of drafting.
  - E. Knowledge of applicable public safety principles and practices.
  - F. Knowledge of the principles of technical writing.
  - G. Knowledge of the principles of surveying.
  - H. Knowledge of the City of Duluth Utility Systems.
  - I. Knowledge of GIS.
  - J. Knowledge of Emergency Response procedures.
  - K. Knowledge of problem-solving and conflict-resolution techniques.
  - L. Knowledge of applicable safety requirements.
  - M. Knowledge of, or the ability to learn, City policies and procedures.
  
4. Skill Requirements
  - A. Skill in computers, mapping, and surveying.
  - B. Skill in the operation of computer and surveying equipment.
  - C. Skill in the operation of locating equipment and finding records.
  - D. Skill in communicating logically, persuasively, and accurately in oral and written forms to groups and individuals.
  - E. 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.
  - F. Skill in managing one's own time.
  - G. Skill in completing assignments accurately and with attention to detail.
  
5. Ability Requirements
  - A. Ability to operate computers, GIS, and CAD systems.
  - B. Ability to apply standard engineering principles to utility and other public works improvements.
  - C. Ability to prepare specifications, plans, technical reports, resolutions, and petitions.

- D. Ability to perform supervised drafting and design work.
- E. Ability to communicate effectively in oral and written forms.
- F. Ability to work outside in inclement weather and traffic conditions.
- G. Ability to work at heights above an excavation and to climb into and out of excavations.
- H. Ability to communicate and interact effectively with members of the public, contractors, consultants, state and local agencies, and other City divisions.
- I. Ability to recognize, analyze, and solve a variety of problems.
- J. Ability to demonstrate dependability, integrity, responsibility, and consistency in job performance.
- K. 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.
- L. Ability to understand and follow instructions.
- M. Ability to set priorities and complete assignments on time.
- N. Ability to attend work as scheduled and/or required.

Physical Demands

The work requires some physical exertion such as long periods of standing; walking over rough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; recurring lifting of moderately heavy items such as record boxes. The work may require specific, but common, physical characteristics and abilities such as above.

Work Environment

The work environment involves moderate risks or discomforts requiring special safety precautions (e.g., working around moving parts, carts, or machines, or with contagious diseases or irritant chemicals). Employees may be required to use protective clothing or gear such as masks, gowns, coats, boots, goggles, gloves, or shields.

HR: AO	Union: Basic	EEOC: Technicians	CSB: 12/03/2024	Class No: 4106
WC: 9410	Pay: 29	EEOF: Utilities/Transportation	CC:	Resolution:

## Engineering Technician

### SUMMARY/PURPOSE

To perform technical and paraprofessional engineering work ~~in~~ related to the areas design, survey, construction, and inspection of street, bridge, traffic, and utility infrastructure systems including water, gas, sanitary sewer, and storm sewer infrastructure systems.

### 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. Assist in the analysis of Gather preliminary topographic surveys.
1. Provide contractors with construction plans control, stakes, and specifications for survey purposes.
2. Perform work information required to locate survey points.
3. Prepare survey field notes.
- 1.2. Direct the activities of other survey party members construct public improvements.
- 2.3. Operate and maintain survey and GPS (Global Positioning System (GPS) equipment to obtain accurate survey measurements and point locations.
4. Collect, analyze, and record data.
5. Create construction plans, maps, and charts manually or using a computer aided design (CAD) system.
6. Prepare graphic representations of Geographic Information Systems (GIS) using GIS software.
- 3.4. Process survey information, including computer data entry work.
7. Estimate construction quantities and prepare appropriate charts.
8. Recommend upgrades and revisions to project procedures and practices.
5. Prepare graphic representations of Geographic Information Systems (GIS) using GIS software, review existing GIS data for accuracy, quality, and completeness, and add/or modify existing GIS databases.
6. Create roadway and public infrastructure improvement plans using Autodesk software, preliminary designs, quantity takeoffs, cost estimates, and prepare engineering reports and related studies to assist in the planning and implementation of public infrastructure projects.
7. Prepare bidding documents for public roads, trails, utilities, and other public infrastructure improvements.
8. Perform construction administration and on-site inspection to ensure that all work is constructed in conformance with the plans, specifications, and industry standards.
9. Maintain accurate recordkeeping, including daily log of construction activities and write progress and final reports.
- 4.9. Assist in preparing, measurements of quantities and pay items, change orders and supplemental agreements for approval, and other documentation and reports as associated with city, municipal state aid, and/or federal aid funded projects.
10. Document construction quantities.
11. Perform quality control tests on construction materials.
10. Prepare record drawings.
11. Act as a liaison between the public, business community, contractors, and City Administration.
- 5.12. Locate underground utilities including water, gas, sanitary sewer, and storm sewer systems.
- 6.13. Investigate complaints, inquiries, and requests.
- 7.14. Study and report findings, conclusions, and recommendations in oral and/or written form.
- 8.15. Review construction plans and specifications for compliance with City standards.

- 9.16. Maintain, revise, and research manual or computer records.
- ~~12. Participate in technical engineering studies and provide recommendations.~~
- ~~13. Maintain, add, or modify existing GIS databases.~~
- ~~14. Review existing or incoming GIS data for accuracy, quality, and completeness.~~
17. Coordinate work activities with contractors, outside agencies, other City personnel, and property owners.
18. Assist a certified MnDOT Team Leader in completing Bridge Safety inspections of the City's bridge inventory.
19. Act as a competent person and/or incident commander during emergency situations.
20. 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.
21. 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. License Requirements

- A. ~~Possession of a valid Minnesota Class "D" driver's license or privilege by date of appointment and thereafter in order to operate city vehicle.~~

#### 1. Education & Experience Requirements

- A. ~~Completion of a two-year Associate's Degree in Civil Engineering Technology degree, or equivalent; a related professional field, and two (2) years of verifiable work-related professional experience in a position within the engineering position; or~~
- A. A combination field; OR a minimum of four (4) years of related education and/or experience determined to be equivalent full-time, verifiable professional work experience in a position within the engineering field.

#### 2. License & Certification Requirements

- A. Possess and maintain a valid Minnesota Class D driver's license or privilege.
- B. Must obtain and maintain current Minnesota Department of Transportation (MnDOT) certifications for Bituminous, Concrete and Aggregate within two (2) years of date of hire.
- C. Must obtain and maintain natural gas Operator Qualifications (OQs) within one (1) year of date of hire.
- D. Must obtain and maintain Minnesota Erosion and Stormwater Management Certification as required within one (1) year of date of hire.
- E. Must obtain and maintain MnDOT ADA sidewalk certification within one (1) year of date of hire.
- F. Bridge Construction, Bridge Inspection, and Signal and Lighting certifications may be required by supervisor.

#### 2.3. Knowledge Requirements

- A. ~~A.—Knowledge of algebra, geometry, and trigonometry.~~
- B. ~~B.—Knowledge of technical engineering principles and practices.~~
- C. ~~C.—Knowledge of the principles, methods, equipment, and materials used in construction of streets, sidewalks, bridges, traffic, and utility infrastructure systems including water and gas mains, sanitary and sewer, storm sewers, and various public works structures.~~
- D. ~~D.—Knowledge of the principles of drafting.~~
- E. ~~E.—Knowledge of applicable public safety principles and practices.~~
- F. ~~F.—Knowledge of the principles of technical writing.~~
- G. ~~G.—Knowledge of the principles of surveying.~~

- H. Knowledge of the City of Duluth Utility Systems.
- I. Knowledge of GIS.
- J. Knowledge of Emergency Response procedures.
- K. Knowledge of problem-solving and conflict-resolution techniques.
- L. Knowledge of applicable safety requirements.
- M. Knowledge of, or the ability to learn, City policies and procedures.

3.4. Skill Requirements

- A. Skill in ~~drafting~~computers, mapping, and surveying.
- B. Skill in the operation of ~~drafting~~computer and surveying equipment.
- C. Skill in the operation of locating equipment and finding records.
- D. Skill in communicating logically, persuasively, and accurately in oral and written forms to groups and individuals.
- E. 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.
- F. Skill in managing one's own time.
- G. Skill in completing assignments accurately and with attention to detail.

4.5. Ability Requirements

- A. Ability to operate computers, GIS, and CAD systems.
- B. Ability to apply standard engineering principles to utility and other public works improvements.
- C. Ability to prepare specifications, plans, technical reports, resolutions, and petitions.
- D. Ability to perform supervised drafting and design work.
- E. Ability to communicate effectively in oral and written forms.
- F. Ability to ~~attain and maintain state certification requirements~~work outside in inclement weather and traffic conditions.
- G. ~~Ability to establish and maintain effective working relationships with co-workers, supervisors~~work at heights above an excavation and to climb into and out of excavations.
- G-H. ~~Ability to communicate and interact effectively with members of the public, contractors, consultants, outside state and local agencies, and the general public~~other City divisions.
- H-A. ~~Ability to attend work on a regular basis.~~

2. ~~Physical~~ Physical Ability Requirements

- I. ~~Ability to transport oneself to, from, and around work sites~~ recognize, analyze, and solve a variety of problems.
  - A. ~~Ability to work outdoors year round.~~
  - B. ~~Ability to walk for long distances.~~
- J. Ability to demonstrate dependability, integrity, responsibility, and consistency in job performance.
- K. 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.
- L. Ability to understand and follow instructions.
- J-M. Ability to transport and erect survey equipment up to 50 pounds set priorities and complete assignments on time.
- N. Ability to frequently stand, walk, sit, type, talk, hear, use near, mid, attend work as scheduled and/or required.

Physical ~~far vision~~ Demands

The work requires some physical exertion such as long periods of standing; walking over rough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; recurring lifting of moderately heavy items such as record boxes. The work may require specific, but common, physical characteristics and abilities such as above.

Work Environment

The work environment involves moderate risks or discomforts requiring special safety precautions (e.g., working around moving parts, carts, or machines, or with frequent field of vision, contagious diseases or irritant chemicals). Employees may be required to use protective clothing or gear such as masks, gowns, coats, boots, goggles, gloves, or shields.

~~C. Ability to occasionally lift, carry, push, pull, climb, balance, stoop, crouch, reach, handle, smell, and use depth perception, visual accommodation, and color vision.~~

HR: <u>MSAQ</u>	Union: Basic	EEOC: Technicians	CSB: <del>42/40/2013</del>	Class No: 4106
WC: 9410	Pay: 28	EEOF: Utilities/Transportation	CC: 40/13/2014	Resolution: 44- <del>0533R</del>