Senior Engineering Technician

SUMMARY/PURPOSE

To perform technical and complex 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.

DISTINGUISHING FEATURES OF THE CLASS

Employees at this level are distinguished from the Engineering Technician by the level of responsibility assumed, complexity of projects, and the experience held.

SUPERVISION RECEIVED

The supervision provides minimal guidance on day-to-day operations indicating generally what is to be done, the limitations, quality and quantity expected, deadlines, and priority of assignments. The supervisor provides additional, specific instructions for new, difficult, or unusual assignments, including suggested work methods or resources.

SUPERVISION GIVEN

Does not have direct supervisory responsibility but does have some oversight of employees or projects that require delegation and direction over the work of others.

ESSENTIAL DUTIES & RESPONSIBILITIES

1. Perform all duties listed under the Engineering Technician job duties and responsibilities.
2. Conduct field surveys of project sites to obtain and analyze project-related data and field information.
3. Provide construction staking to ensure projects are built to the designed alignment, profile grade, and cross section.
4. Lead staff on complex construction and preliminary surveys.
5. Prepare engineering and construction project plans using Autodesk software for street, bridge, traffic, and/or utility infrastructure systems including water, gas, sanitary sewer, and storm sewer; prepare project specifications, assist with coordination of required advertising for bids, review of construction bids, and other project-related activities.
6. Direct and participate in project construction inspection work on major projects, including coordinating engineering and contractor work details, ensuring compliance with project/design specifications, coordination of material testing, evaluating field conditions, recommending field design changes, preparing progress reports and construction records.
7. Lead personnel in survey, inspection, drafting and design work as assigned.
8. Draft and calculate field notes to document quantities, alignment, grade, and locations according to project plans or to document monthly and final progress payment estimates and change orders.
9. Research records and maps to obtain engineering data such as location of survey monuments, sewer stubs, water mains, water services, hydrants, gas mains, and gas services.
10. Maintain engineering, survey, and infrastructure records.
11. Prepare and draft record drawings for street, water, sewer, gas, and storm infrastructure.
12. Perform a variety of office related functions, including preparing permits, correspondence, maps, presentation materials, brochures, reducing field notes, printing materials, answering phones, and responding to inquiries from contractors, developers, property owners, staff, and the general public.
13. Coordinate with other city departments and private property owners, related to changes of Right-of-Way, property lines, and easement disputes due to current and proposed infrastructure work.
14. Assist in the development of long-range infrastructure studies and plans, maintenance management plans, and environmental assessments.
15. Act as a competent person and incident commander during emergency situations.

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 five (5) years of verifiable professional work experience in a position within the engineering field with similar complexity and level of responsibility; OR a minimum of seven (7) years of related education and/or full-time, verifiable professional experience in a position within the engineering field with similar complexity and level of responsibility; OR current classification as a City of Duluth Engineering Technician at the highest Step of the associated pay range.

2. License & Certification Requirements
   A. Possess and maintain a valid Minnesota Class D driver's license or privilege.
   B. Must obtain and maintain, at a minimum, 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 and storm sewers, and various public work structures.
   D. Knowledge of traffic engineering principles.
   E. Knowledge of design and layout methods.
   F. Knowledge of regulatory agencies affecting design and construction.
   G. Knowledge of applicable safety principles and practices.
   H. Knowledge of the principles of technical writing.
   I. Knowledge of federal, state, and local legislation affecting departmental operations and appropriate professional design standards.
   J. Knowledge of principles of surveying.
   K. Knowledge of City of Duluth Utility systems.
   L. Knowledge of Geographic Information Systems (GIS).
   M. Knowledge of effective leadership and personal practices.
   N. Knowledge of public works design and construction principles, practices, and methods.
   O. Knowledge of applicable City policies, laws, and regulations affecting engineering and public works activities.
   P. Knowledge of Emergency Response Procedures.
   Q. Knowledge of Minnesota Uniform Traffic Control Devices manual.
   R. Knowledge of problem-solving and conflict-resolution techniques.
   S. Knowledge of, or the ability to learn, City policies and procedures.

4. Skill Requirements
   A. Skill in AutoCAD, GIS applications, 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 and the time of others.
G. Skill in completing assignments accurately and with attention to detail.
H. Skill in using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.

5. Ability Requirements
A. Ability to operate computers, GIS, and CAD systems.
B. Ability to apply standard engineering principles to utility and other public work improvements.
C. Ability to prepare specifications, plans, technical reports, resolutions, and petitions to current standards.
D. Ability to perform supervised and unsupervised design and layout work.
E. Ability to establish and maintain effective working relationships with co-workers, supervisors, contractors, consultants, outside agencies, and the general public.
F. Ability to identify and perform proper setup and removal of temporary traffic control devices and recognize improper setup.
G. Ability to read, interpret, analyze, and explain technical manuals, data, plan sets, maps, and other complex materials.
H. Ability to work outside in inclement weather and under traffic conditions.
I. Ability to work at heights above an excavation and to climb into and out of excavations.
J. Ability to mentor, train, and lead others.
K. Ability to work unsupervised at times under the direction of Engineers and/or other co-workers, all while completing job requirements as needed.
L. Ability to think logically, methodically, and make educated judgments using knowledge and experience.
M. Ability to prepare, organize, and maintain engineering field and office data, reports, and systems.
N. Ability to effectively communicate technical information, orally and in writing, to contractors, developers, property owners, employees, consultants, other governmental agency representatives, City officials, and the general public.
O. 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.
P. Ability to communicate and interact effectively with members of the public.
Q. Ability to communicate effectively both orally and in writing.
R. Ability to recognize, analyze, and solve a variety of problems.
S. Ability to organize and prioritize work while meeting multiple deadlines.
T. Ability to handle difficult and stressful situations with professional composure.
U. Ability to work successfully as a member of a team and independently with minimal supervision.
V. Ability to interpret and apply laws, contracts, regulations, policies, and procedures.
W. Ability to enforce safety rules and regulations.
X. Ability to maintain confidential information.
Y. Ability to demonstrate dependability, responsibility, and consistency in job performance.
Z. 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: 1801
WC: 9410	Pay: 32	EEOF: Utilities/Transportation	CC:	Resolution:

Senior Engineering Technician

SUMMARY/PURPOSE

To perform technical and ~~paraprofessional~~complex 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~~.

DISTINGUISHING FEATURES OF THE CLASS

Employees at this level are distinguished from the Engineering Technician by the level of responsibility assumed, complexity of projects, and the experience held.

SUPERVISION RECEIVED

The supervision provides minimal guidance on day-to-day operations indicating generally what is to be done, the limitations, quality and quantity expected, deadlines, and priority of assignments. The supervisor provides additional, specific instructions for new, difficult, or unusual assignments, including suggested work methods or resources.

SUPERVISION GIVEN

Does not have direct supervisory responsibility but does have some oversight of employees or projects that require delegation and direction over the work of others.

ESSENTIAL DUTIES ~~AND~~& RESPONSIBILITIES ~~(other~~

1. Perform all duties ~~may be assigned)~~listed under the Engineering Technician job duties and responsibilities.

2. ~~Analyze~~Conduct field surveys of project sites to obtain and analyze project-related data and field information.
3. Provide construction staking to ensure projects are built to the designed alignment, profile grade, and cross section.
4. Lead staff on complex construction and preliminary surveys.
~~2.~~5. Prepare engineering and construction project plans ~~and~~ using Autodesk software for street, bridge, traffic, and/or utility infrastructure systems including water, gas, sanitary sewer, and storm sewer; prepare project specifications ~~for survey purposes~~, assist with coordination of required advertising for bids, review of construction bids, and other project-related activities.

~~1. Perform work to locate survey points.~~
~~2. Prepare survey field notes.~~
~~3.~~ Direct ~~the activities of other survey party members.~~
~~4. Operate~~ and ~~maintain survey and GPS (Global Positioning System) equipment to obtain accurate survey measurements and point locations.~~
~~5. Collect, analyze, and record data.~~
~~6. Create~~ participate in project construction ~~plans, maps, and charts manually or using a computer-aided-design (CAD) system.~~
~~7. Prepare graphic representations of Geographic Information Systems (GIS) using GIS software.~~
~~8. Process survey information~~inspection work on major projects, including ~~computer data entry~~coordinating engineering and contractor work~~.~~
~~9. Estimate~~ details, ensuring compliance with project/design specifications, coordination of material testing, evaluating field conditions, recommending field design changes, preparing progress reports and construction ~~quantities and prepare appropriate charts.~~
~~10. Recommend upgrades and revisions to project procedures and practices.~~

~~3.~~6. ~~Prepare individually-tailored hard copies of automated maps using computer base maps~~records.
~~4.~~7. Lead personnel in survey, inspection, drafting and design work as assigned.

8. Draft and calculate field notes to document quantities, alignment, grade, and locations according to project plans or to document monthly and final progress payment estimates and change orders.
9. Research records and maps to obtain engineering data such as location of survey monuments, sewer stubs, water mains, water services, hydrants, gas mains, and gas services.
~~5.~~10. Maintain engineering ~~plans and~~, survey ~~files~~, and infrastructure records.
~~11. Coordinate work activities with contractors, outside agencies, other City personnel, and property owners.~~
~~12. Monitor and inspect construction projects to ensure conformance.~~
~~13. Maintain daily log of construction activities and write progress and final reports.~~
~~14. Prepare change orders and supplemental agreements for approval.~~
~~15. Document construction quantities.~~
~~16. Perform quality control tests on construction materials.~~
~~17. Lead personnel in construction inspections as assigned.~~
~~18. Locate underground utilities including water, gas, sanitary sewer and storm sewer systems.~~
~~19. Act as lead worker in assigned responsibilities.~~
~~20. Review construction plans and specifications for compliance with City standards.~~
~~21. Maintain, add, or modify existing GIS databases.~~
~~22. Review existing or incoming GIS data for accuracy, quality, and completeness.~~
~~23. Maintain, revise, and research manual or computer records.~~
~~24. Develop computerized record keeping procedures.~~
~~25. Issue required permits.~~
~~26. Investigate complaints, inquiries, and requests, and recommend solutions.~~
~~27. Prepare and interpret property descriptions.~~
11. Prepare and draft record drawings for street, water, sewer, gas, and storm infrastructure.
12. Perform a variety of office related functions, including preparing permits, correspondence, maps, presentation materials, brochures, reducing field notes, printing materials, answering phones, and responding to inquiries from contractors, developers, property owners, staff, and the general public.
13. Coordinate with other city departments and private property owners, related to changes of Right-of-Way, property lines, and easement disputes due to current and proposed infrastructure work.
~~6.~~14. Assist in the development of long-range infrastructure studies and plans, maintenance management plans, and environmental assessments.
~~28. Participate in technical engineering studies and provide recommendations.~~
~~29. Study and report findings, conclusions, and recommendations in oral and written form.~~
15. Act as a competent person and incident commander during emergency situations.

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 ~~and~~& Experience Requirements
~~A. Classified as a City of Duluth Engineering Technician, pay grade 28, Step E; or~~
~~B. Completion of a two-year~~ Associate's Degree in Civil Engineering Technology ~~degree or equivalent;~~or a related professional field, and five (5) years of verifiable professional work experience in ~~an~~a position within the engineering ~~position; or~~

A. ~~A combination of~~field with similar complexity and level of responsibility; OR a minimum of seven (7) years of related education and/or full-time, verifiable professional experience ~~determined to be equivalent~~in a position within the engineering field with similar complexity and level of responsibility; OR current classification as a City of Duluth Engineering Technician at the highest Step of the associated pay range.

2. License & Certification Requirements
   A. Possess and maintain a valid Minnesota Class D driver's license or privilege.
   B. Must obtain and maintain, at a minimum, 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. 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, ~~sidewalks,~~bridges, traffic, and utility infrastructure systems including water ~~and,~~ gas ~~mains~~, sanitary and storm sewers, and various public work~~s~~ structures.
   D. Knowledge of traffic engineering principles.
   E. Knowledge of design and layout methods.
   F. Knowledge of regulatory agencies affecting design and construction.
   G. Knowledge of applicable safety principles and practices.
   H. Knowledge of the principles of technical writing.
   I. Knowledge of federal, state, and local legislation affecting departmental operations and appropriate professional design standards.
   J. Knowledge of principles of surveying.
   K. Knowledge of City of Duluth Utility systems.
   L. Knowledge of Geographic Information Systems (GIS).
   M. Knowledge of effective leadership and personal practices.
   N. Knowledge of public works design and construction principles, practices, and methods.
   O. Knowledge of applicable City policies, laws, and regulations affecting engineering and public works activities.
   P. Knowledge of Emergency Response Procedures.
   Q. Knowledge of Minnesota Uniform Traffic Control Devices manual.
   R. Knowledge of problem-solving and conflict-resolution techniques.
   S. Knowledge of, or the ability to learn, City policies and procedures.

~~3.~~4. Skill Requirements
   A. Skill in ~~drafting, mapping~~AutoCAD, GIS applications, 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 and the time of others.
   G. Skill in completing assignments accurately and with attention to detail.
   H. Skill in using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.

~~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 work improvements.
C. Ability to prepare specifications, plans, technical reports, resolutions, and petitions to current standards.
D. Ability to perform supervised and unsupervised design and layout work.
~~A. Ability to communicate effectively in oral and written forms.~~
~~B. Ability to attain and maintain state certification requirements.~~
E. Ability to establish and maintain effective working relationships with co-workers, supervisors, contractors, consultants, outside agencies, and the general public.
F. Ability to ~~provide training~~ identify and perform proper setup and removal of temporary traffic control devices and recognize improper setup.
G. Ability to read, interpret, analyze, and explain technical manuals, data, plan sets, maps, and other complex materials.
H. Ability to work outside in inclement weather and under traffic conditions.
I. Ability to work at heights above an excavation and to climb into and out of excavations.
J. Ability to mentor, train, and lead others.
~~F.~~K. Ability to work unsupervised at times under the direction of Engineers and/or other co-workers, all while completing job requirements as needed.
L. Ability to think logically, methodically, and make educated judgments using knowledge and experience.
M. Ability to prepare, organize, and maintain engineering field and office data, reports, and systems.
N. Ability to effectively communicate technical information, orally and in writing, to contractors, developers, property owners, employees, consultants, other governmental agency representatives, City officials, and the general public.
O. 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.
P. Ability to communicate and interact effectively with members of the public.
Q. Ability to communicate effectively both orally and in writing.
R. Ability to recognize, analyze, and solve a variety of problems.
S. Ability to organize and prioritize work while meeting multiple deadlines.
T. Ability to handle difficult and stressful situations with professional composure.
U. Ability to work successfully as a member of a team and independently with minimal supervision.
V. Ability to interpret and apply laws, contracts, regulations, policies, and procedures.
W. Ability to enforce safety rules and regulations.
X. Ability to maintain confidential information.
Y. Ability to demonstrate dependability, responsibility, and consistency in job performance.
Z. Ability to attend work as scheduled and/or required.

Physical ~~Ability Requirements~~Demands

~~A. Ability to transport oneself to, from, and around work sites.~~
~~B. Ability to work outdoors year round.~~
~~C. Ability to walk for long distances.~~
~~D. Ability to transport and erect survey equipment up to 50 pounds.~~
~~E. Ability to frequently stand, walk, sit, type, talk, hear, use near, mid, and far vision with frequent field of vision.~~
~~F. Ability to occasionally lift, carry, push, pull, climb, balance, stoop, crouch, reach, handle, smell, and use depth perception, visual accommodation, and color vision.~~

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: ~~MS~~AO	Union: Basic	EEOC: Technicians	CSB: ~~12/10/2013~~	Class No: 1801
WC: 9410	Pay: ~~31~~	EEOF: Utilities/Transportation	CC: ~~10/13/2014~~	Resolution: ~~14-0534R~~