

# SCOPE OF WORK

## NON-PROJECT-SPECIFIC SUBSURFACE UTILITY ENGINEERING AND UTILITY COORDINATION SERVICES

### I. GENERAL

#### A. Definitions and Terms.

1. *CI/ASCE 38-02*: "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," American Society of Civil Engineers, 2003.
2. *DOT*: State Department of Transportation and/or its authorized representative(s), as the context implies.
3. *Consultant*: The individual or firm directly, or indirectly through sub-consultants, providing engineering and design-related services as a party to the contract.
4. *Contract Manager*: The designated DOT representative responsible to coordinate, authorize, and monitor the status of task orders issued pursuant to the contract.
5. *Project Manager*: The designated DOT representative, typically from the involved DOT region, responsible on a specific project to evaluate and prescribe SUE needs, and to monitor the performance of approved tasks.
6. *R.S.*: Revised Statutes, as amended [Replace this reference with the name of applicable State statute].
7. *MUTCD*: "Manual on Uniform Traffic Control Devices," U.S. Department of Transportation, Millennium Edition, December 2000.
8. *QL A*: Utility Quality Level A as further described herein. Generally, QL A indicates the precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point.
9. *QL B*: Utility Quality Level B as further described herein. Generally, QL B indicates information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities.
10. *QL C*: Utility Quality Level C as further described herein. Generally, QL C indicates information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating such information to QL D information.

11. *QL D*: Utility Quality Level D as further described herein. Generally, QL D indicates information derived from existing records and oral recollections.

12. *Subsurface Utility Engineering, or SUE*: A branch of engineering practice that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design.

13. *UNC*: Utility Notification Center.

14. *Utility Quality Level*: A professional opinion of the quality and reliability of utility information. Such reliability is determined by the means and methods of the professional.

#### B. Work Locations.

1. Potential projects on which SUE may be required are at undetermined locations statewide. The specific projects will be as determined by DOT.
2. Work under this contract will be authorized by means of task orders specific to the applicable project. The Consultant is reminded that this contract does not guarantee the amount of work, if any, available under the contract.

#### C. Range of Services.

1. The work to be performed will be only as specified in individual task orders, and may include any or all of the activities described herein.
2. The intent of this contract is twofold: (a) to achieve accuracy and economy in project-driven utility inventories, conflict assessment, and relocations, through the application of SUE techniques that are not otherwise readily available to DOT; and (b) to enable DOT to assign various tasks (such as utility coordination, utility relocation design, cost estimating, agreement development, etc.) that DOT may otherwise perform in-house.
3. *However, the primary services anticipated to be rendered hereunder are QL A and QL B mapping.*

#### D. Work Inspections.

1. The Consultant shall make reasonable provision for DOT representatives to observe the Consultant's work in progress.

#### E. DOT Assistance.

DOT will furnish the following at no cost to the Consultant:

1. Copies of applicable manuals, policies and procedures, forms, or other standard documentation.

2. Copies of applicable “as constructed” plans showing information pertinent to the work.
3. Information, if known, on involved utilities, such as owner name, contact person, permit records, or utility maps; provided, however, that DOT does not warrant the accuracy or completeness of such information.
4. Prints or electronic files of project plans, profiles, cross sections, details, or correspondence pertinent to the work.
5. Alignment, centerline, profile, and survey control data.
6. Liaison with utility owners and property owners as necessary to facilitate the Consultant’s access to pertinent records or property.

F. Work Standards.

1. Except as may be modified or specified herein, or otherwise approved by DOT, the collection and depiction of information, and any required submittals, shall conform to the applicable provisions of CI/ASCE 38-02, “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.” A copy of CI/ASCE 38-02 is available for inspection by contacting the DOT Contract Manager; or may be ordered from the American Society of Civil Engineers at [www.asce.org](http://www.asce.org).
2. It is intended that this Scope of Work be construed harmoniously with CI/ASCE 38-02; however, in the event of conflict, the provisions of this Scope of Work shall take precedence.

G. Submittals.

1. All required reports, documentation, studies, field notes and sketches, plan drawings, and electronic data shall be submitted for review and acceptance by the Project Manager.
2. When applicable, the Consultant shall submit an example of an original plan sheet and obtain approval from DOT prior to drafting plans.
3. Final submittals shall incorporate any corrections or revisions resulting from DOT’s review.

H. Certification.

1. The Consultant’s Professional Engineer or Professional Land Surveyor in responsible charge of the work shall perform a final review of, seal, and sign all applicable submittals, including but not limited to original field notes and sketches (or copies of same if approved by DOT), hard copies of electronic data, and plan drawings.

I. Plan Drawings.

1. Plan drawings shall conform to the requirements set forth in the DOT Drafting Manual, or as otherwise directed or approved by DOT.
2. Drawings with colors shall be reproducible by all printing or duplication media in black-and-white.
3. Drafting and lettering shall be of proper density and legibility for a 50% reduction during reproduction.
4. The depiction of attributes such as line type, material type, age, condition, ownership, status (e.g., in-service, out-of-service, active, abandoned), number of conduits or direct buried cables, or other required information, shall not be eliminated, obliterated, or obscured by the manner of reproduction or by 50% reduction in size.
5. Final drawings for reproduction shall have all drafting work and image on one side of the sheet.
6. The Consultant shall replace, at no cost to DOT, plan sheets that do not comply with the above criteria.

J. Electronic Data.

1. The Consultant's selected hardware and software, methodology, and format for deliverables, shall conform to the applicable requirements of the DOT Survey and/or Drafting Manuals, or shall be as otherwise directed or approved by DOT.
2. The Consultant shall contact the Project Manager, prior to creating any electronic data, to verify the current collection and submission requirements.
3. The Consultant shall identify each unit of magnetic media submitted, with adhesive labels affixed to the media and containing identifying and archival information prescribed by the Project Manager.
4. A letter must accompany the magnetic media and shall contain the same information as required to be affixed to the media, and shall also contain a description of the software utilized.

**II. MISCELLANEOUS TASKS**

A. Training and Orientation.

1. Assist DOT in conducting training and orientation sessions for interested parties. A training session will cover such items as available services, detection and excavation technology, project deliverables, and task order development.

B. Scoping Assistance for Task Orders.

1. Assist DOT in developing the scope of work for a subsequent task order by assessing project SUE needs, generating alternatives, and/or making recommendations.

C. Work Plan and Schedule.

1. Develop a detailed work plan and schedule of activities showing conformance to the work requirements and time constraints imposed by the task order; and obtain DOT's approval of said work plan prior to commencing work.

D. Mobilization.

1. Deploy necessary personnel, equipment, and supplies from the Consultant's central location to the work site, in preparation for the work.
2. Unless otherwise approved by DOT, the Consultant shall not be compensated for more than one mobilization per task.

E. Traffic Control.

1. Whenever the work will affect the movement of traffic or traffic safety, provide traffic control and utilize traffic control devices in conformance with the MUTCD, and [if applicable, the State supplement thereto adopted pursuant to State Statute].
2. Traffic Control shall be directed by a worksite traffic supervisor certified by the American Traffic Safety Services Association (ATSSA), or the [State] Contractors Association (CCA).
3. The Consultant's Traffic Control Plan (TCP) and Method(s) of Handling Traffic (MHT(s)) shall be subject to acceptance by DOT prior to commencing work.

F. Permits and Rights of Entry.

1. Obtain all necessary permits from DOT and/or local jurisdictions to allow the Consultant to work within public rights of way.
2. If work must be performed on private property, the Consultant shall obtain written permission from the property owner for the Consultant and DOT to enter the premises, including names and telephone numbers of contact persons should notification prior to entry be necessary.
3. Work on DOT rights of way may require a Special Use Permit or similar authorization, which will prescribe necessary conditions and controls. The DOT Project Manager will provide liaison between the Consultant and the involved DOT permit office.

G. Condition Assessments.

1. Perform interior pipewall inspections and/or thickness tests of existing buried utility lines, utilizing video, ultrasonic, and/or visual techniques as appropriate.

#### H. Aerial or Ground-Mounted Utility Facilities.

1. If specified by DOT, Quality Level D or C services as further described herein shall include records research, identification, surveying, correlation, and/or depiction of aerial or ground-mounted utilities, notwithstanding that such surface features may not be associated with an existing subsurface utility line or system.

#### I. Unknown Lines.

1. If, when performing an assigned task, the Consultant detects line(s) of unknown function, status, or ownership, the Consultant shall obtain, record, and depict information on such line(s) to a quality level that is commensurate with that of the original assigned task.

### **III. PROJECT UTILITY COORDINATION/DESIGN TASKS**

#### A. Project Meetings, Site Reviews.

1. Attend project meetings and/or site reviews with DOT staff and/or other involved parties.
2. Record and report on proceedings.

#### B. Preconstruction Utility Coordination.

Coordination activities include but are not limited to:

1. Implement and comply with established DOT project utility coordination procedures.
2. Notify and furnish preliminary project data to involved utility owners.
3. Provide liaison among DOT, utility owners, and other involved parties.
4. Schedule and conduct coordination meetings and field reviews with utility owners.
5. Identify and coordinate the resolution or mitigation of utility conflicts.
6. Determine financial responsibility for utility relocation costs.
7. Negotiate and secure utility relocation agreements, owner commitments, or sign-offs.
8. Facilitate the incorporation of existing/proposed utility facility information into project plans.

9. Prepare project contract documents describing utility activities and utility/contractor coordination requirements.

10. Prepare project utility clearance documents certifying that all utility work has been completed, or that all necessary arrangements have been made for the work to be properly coordinated with the highway construction project.

C. Conflict Assessment, Development of Alternatives, Cost Estimates.

1. Work with DOT and utility owners to determine conflict points between planned construction and existing or planned utility facilities.

2. Develop and make recommendations on relocation alternatives, with emphasis on cost effectiveness and on minimizing conflicts.

3. Develop or facilitate comparative cost estimates.

D. Utility Design.

1. Subject to owners' approval, design and prepare plans and specifications for utility facilities to be relocated or installed on the DOT project.

2. Incorporate utility design information into project plans and furnish documentation to DOT and/or utility owners as needed.

3. Comply with applicable DOT and/or utility design standards and DOT utility accommodation policies.

E. Construction Coordination and Monitoring.

1. Provide liaison among DOT, construction contractors, and utility owners in the coordination, scheduling, and performance of utility work.

2. Monitor and report on utility relocation or installation work.

3. Determine and ensure compliance with construction plans, specifications, and schedules.

4. Negotiate field changes as conditions warrant.

5. Prepare as-built documentation and quantities.

**IV. QUALITY LEVEL D TASKS**

Tasks leading to QL D include:

A. Records and Information Research.

1. Conduct appropriate investigations (e.g., owner records, DOT records, UNCL records, County records, personal interviews, visual inspections, etc.), to help identify utility owners that may have facilities within the project limits or that may be affected by the project.

**B. Records Collection.**

1. Collect applicable records (e.g., utility owner base maps, “as built” or record drawings, permit records, field notes, geographic information system data, oral histories, etc.) on the existence and approximate location of existing involved utilities.

**C. Records Review.**

1. Review records for: evidence or indication of additional available records; duplicate or conflicting information; need for clarification.

**D. Aerial or Ground-Mounted Facilities.**

1. Include records research, identification, and depiction of aerial or ground-mounted utility facilities in QL D tasks if specified (see “Miscellaneous Tasks”).

**E. Compilation and Presentation of Data.**

1. Transfer information on all involved utilities to appropriate plan sheets, electronic files, and/or other documents as required or directed by DOT.
2. Exercise professional judgment to resolve conflicting information.
3. For information depicted, indicate: utility **type** and ownership; date of depiction; quality level(s); end points of any utility data; line status (e.g., active, abandoned, out of service); line size and condition; number of jointly buried cables; and encasement.

**V. QUALITY LEVEL C TASKS**

Tasks leading to QL C include:

**A. Inclusive of QL D Tasks.**

1. Perform tasks as described for QL D. There is no prescribed order in which QL D and C tasks must be performed.

**B. Identification of Surface Utility Features.**

1. Identify surface features, from project topographic data (if available) and from field observations, that are surface appurtenances of subsurface utilities.

**C. Aerial or Ground-Mounted Facilities.**

1. Include survey and correlation of aerial or ground-mounted utility facilities in QL C tasks if specified (see “Miscellaneous Tasks”).

D. Surveys.

1. Survey surface features of subsurface utility facilities or systems, if such features have not already been surveyed by a registered professional. If previously surveyed, check survey data for accuracy and completeness.
2. The survey shall also include (in addition to subsurface utility features visible at the ground surface): determination of invert elevations of any manholes and vaults; sketches showing interior dimensions and line connections of such manholes and vaults; any surface markings denoting subsurface utilities, furnished by utility owners for design purposes.

E. Confined Space Procedures.

1. Whenever the work requires the entry of personnel into confined spaces (including but not limited to manholes, vaults, and pipes), comply with applicable OSHA (Occupational Safety and Health Administration, U.S. Department of Labor) procedures and requirements.

F. Correlation, Interpretation, and Presentation of Data; Resolution of Discrepancies.

1. Exercise professional judgment to correlate data from different sources, and to resolve conflicting information.
2. Update (or prepare) plan sheets, electronic files, and/or other documents to reflect the integration of QL D and QL C information.
3. Recommend follow-up investigations (e.g., additional surveys, consultation with utility owners, etc.) as may be needed to further resolve discrepancies.
4. As appropriate, amend the indicated quality level of depicted information.

**VI. QUALITY LEVEL B TASKS**

Tasks leading to QL B include:

A. Inclusive of QL C Tasks.

1. Perform tasks as described for QL C. There is no prescribed order in which QL C and B tasks must be performed.

B. Line Detection and Marking.

1. Select and apply appropriate surface geophysical method(s) to search for and detect subsurface utilities within the project limits, and/or to trace a particular utility line or system.

2. Based on an interpretation of data, mark the indications of utilities on the ground surface, for subsequent survey. Utilize paint or other method acceptable to DOT for marking of lines.
3. Utilize the uniform color code of the American Public Works Association for marking of utilities.
4. Unless otherwise directed, mark centerline of single-conduit lines, and outside edges of multi-conduit systems.
5. Unless otherwise approved, maintain horizontal accuracy of +/- 1.5 feet (450 mm) in the marking of lines.
6. As an alternative to the physical marking of lines, the Consultant may, with DOT's approval, utilize other means of data collection, storage, retrieval, and reduction, that enables the correlation of surface geophysical data to the project's survey control.

#### D. Surveys.

1. Survey all markings that indicate the presence of a subsurface utility.
2. Perform surveys to a horizontal accuracy consistent with applicable DOT survey standards. Reference surveys to the project's survey control.
3. If requested, record depth information as may be indicated by the particular detection method used.

#### E. Correlation, Interpretation, and Presentation of Data; Resolution of Discrepancies.

1. Exercise professional judgment to correlate data from different sources, and to resolve conflicting information.
2. Update (or prepare) plan sheets, electronic files, and/or other documents to reflect the integration of QL D, QL C, and QL B information.
3. Recommend follow-up investigations (e.g., additional surveys, consultation with utility owners, etc.) as may be needed to further resolve discrepancies.
4. As appropriate, amend the indicated quality level of depicted information.

## **VI. QUALITY LEVEL A TASKS**

Tasks leading to QL A include:

#### A. Inclusive of QL B Tasks.

1. Perform tasks as described for QL B. There is no prescribed order in which QL B and A tasks must be performed.

**B. Selection of Test Locations.**

1. DOT may require QL A data where the precise horizontal and vertical location of utilities, obtained by exposure and survey of the utility at specific points, is needed for conflict assessment/resolution purposes.
2. The Consultant may recommend test locations based on the requirements of the project and on existing subsurface utility information.

**C. Selection of Method.**

1. When available, verifiable information on previously exposed and surveyed utilities (such as survey records during utility line construction) shall be furnished in lieu of new excavation, exposure, and survey at that same point, or at a suitable nearby point.
2. Otherwise, when utility lines must be exposed and surveyed at specified locations, the Consultant shall use minimally intrusive excavation techniques, acceptable to DOT, that ensure the safety of the excavation, the integrity of the utility line to be measured, and that of other lines which may be encountered during excavation.
3. DOT intends that excavation shall be by means of air- or water-assisted vacuum excavation equipment manufactured specifically for the purpose. Provided, however, that approval of water-assisted vacuum excavation may be subject to additional findings by DOT that such method poses minimal risk of damage to the highway facility or utility lines.

**D. Compliance with UNCL Requirements.**

1. The Consultant shall comply with all applicable provisions of [State Law] when planning or performing excavations at utility test hole sites.
2. Compliance actions include, but are not limited to: notify owners or operators of underground utility facilities at least two (2) business days prior (not including the day of actual notice) to making or beginning excavations in the vicinity of such facilities; call the UNCL at \_\_\_\_\_ for the marking of member utilities; contact non-member utilities directly; coordinate with utility owner representatives as required for inspection or other on-site assistance; immediately cease excavation work and report any resultant utility line damage to owner.

**E. Excavation of Test Holes.**

1. Clear the test hole area of surface debris.
2. In paved areas, neatly cut and remove existing pavement, which cut shall not exceed 225 square inches (0.15 square meters) unless otherwise approved.

3. Excavate the test hole by the method(s) acceptable to DOT and to the standards set forth herein (see also "Selection of Method" above). The nominal diameter of the test hole shall not exceed 15 inches (375 mm) unless otherwise approved.
4. Expose the utility only to the extent required for identification and data collection purposes.
5. Avoid damage to lines, wrappings, coatings, cathodic protection or other protective coverings and features.
6. Hand-dig as needed to supplement mechanical excavation and to ensure safety.
7. Revise the test hole location as necessary to positively expose the utility.
8. Store excavated material for re-use or disposal, as appropriate.

F. Collection, Recording, and Presentation of Data.

Measure and/or record the following information on an appropriately formatted test hole data sheet that has been sealed and dated by the Consultant:

1. Elevation of top and/or bottom of the utility tied to the project datum, to a vertical accuracy of +/- 0.05 feet (15 mm).
2. Elevation of existing grade over utility at test hole.
3. Horizontal location referenced to project coordinate datum, to a horizontal accuracy consistent with applicable DOT survey standards.
4. Field sketch showing horizontal location referenced to a minimum of three (3) swing ties to physical structures existing in the field and shown on the project plans.
5. Approximate centerline bearing of utility line.
6. Outside diameter of pipe, width of duct banks, and configuration of non-encased multi-conduit systems.
7. Utility structure material composition, when reasonably ascertainable.
8. Identity of benchmarks used to determine elevations.
9. Utility facility condition.
10. Pavement thickness and type when applicable.
11. Soil type and site conditions.

12. Identity of utility owner/operator.

13. Other pertinent information as is reasonably ascertainable from test hole.

**G. Site Restoration.**

1. Replace bedding material around exposed utility lines in accordance with owner's specifications or as otherwise directed or approved.

2. Backfill and compact the excavation in a manner acceptable to DOT. If approved, re-use excavated material with appropriate moisture/density control.

3. Install color-coded warning ribbon within the backfill area and directly above the utility line.

4. As applicable, provide permanent pavement restoration within the limits of the original cut using materials, compaction, and pavement thickness acceptable to DOT.

5. Repair or replace backfill or pavement that fails (i.e., subsidence and/or loss of pavement material) within two (2) years of the original restoration work.

6. For excavations in unpaved areas, restore disturbed area as nearly as practicable to pre-existing conditions.

7. Furnish and install permanent surface marker (e.g., P.K. nail, peg, steel pin, or hub) directly above the centerline of the structure and record the elevation of the marker.

**Interpretation of Data and Resolution of Discrepancies.**

1. Exercise professional judgment to correlate data from different sources, and to resolve conflicting information.

2. Update plan/profile sheets, electronic files, and/or other documents to reflect the integration of QL D, QL C, QL B, and QL A information.

3. Recommend follow-up investigations (e.g., additional surveys, consultation with utility owners, etc.) as may be needed to further resolve discrepancies.

4. As appropriate, amend the indicated quality level of depicted information.