

Subsurface Utility Engineering (S.U.E.) Master Contract - 2014

EXHIBIT 2 **GENERAL SCOPE OF WORK**

The CONSULTANT will establish the location of existing underground and overhead utilities within the limits of various MDOT construction projects (in both the design and construction phases) and determine how they will be impacted by the proposed project. Tasks include all necessary research, field investigations, test holes, plotting, design analysis, and recommendations relative to impacts on existing or proposed utility systems by highway and/or bridge construction. The tasks may also include utility relocation design services (water and sanitary sewer) and cost estimating.

The CONSULTANT, in response to a request made by the COMMISSION, will prepare those items identified in Article IV of the CONTRACT. In addition, the CONSULTANT shall prepare a cost fee breakdown which includes, at a minimum, the classification of the employee(s) required to perform the services requested along with their rates and hours estimated to perform the work divided by task.

This scope of work identifies the requirements and procedures for the services to be provided by the CONSULTANT. The CONSULTANT shall provide the specific Tasks identified in the Work Assignment in accordance with the requirements and procedures indicated in this Scope of Work unless specifically stated otherwise in the Work Assignment.

DEFINITIONS AND TERMS:

The following definitions and terms shall be interpreted as follows:

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 CONSULTANT.

QL A: Utility Quality Level A. Indicates the precise horizontal and vertical location of utilities obtained by the Utilities exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point.

QL B: Utility Quality Level B. Indicates information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities.

QL C: Utility Quality Level 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.

QL D: Utility Quality Level D. Indicates information derived from existing records and oral recollections.

Subsurface Utility Engineering (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.

REQUIREMENTS AND PROCEDURES:

The CONSULTANT shall follow all requirements and procedures indicated below unless specifically stated otherwise:

I. General Work Requirements

A. Work Standards

Except as may be modified or specified herein, or otherwise approved by the MDOT Project Manager, 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 may be obtained from the American Society of Civil Engineers at www.asce.org.

B. Certification

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 the MDOT Project Manager), hard copies of electronic data, and plan drawings.

C. Electronic Data

1. The CONSULTANT's selected hardware and software, methodology, and format for deliverables, shall conform to the applicable requirements of the MDOT Survey Manual, or shall be as otherwise directed or approved by the MDOT Project Manager.
2. The CONSULTANT shall contact the MDOT 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 archival information prescribed by the MDOT Project Manager.
4. A letter of submission 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

The CONSULTANT shall perform each of the following tasks as identified in a Work Assignment:

A. Training and Orientation

Assist the MDOT 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 development. These sessions will be further defined in a Work Assignment.

B. Traffic Control

1. Whenever the work will affect the movement of traffic or traffic safety, provide traffic control devices in conformance with the Manual on Uniform Traffic Control Devices (MUTCD) and the latest version of the Mississippi Standard Specifications for Road and Bridge Construction (Redbook).

2. The CONSULTANT's Traffic Control Plan (TCP) and Method(s) of Handling Traffic. (MHT(s)) shall be subject to acceptance by the MDOT Project Manager prior to commencing work.

C. Permits and Rights of Entry

1. The CONSULTANT's selected hardware and software, methodology, and format for deliverables, shall conform to the applicable requirements of the MDOT Survey Manual and MDOT Design Manuals, or shall be as otherwise directed or approved by the MDOT Project Manual.
2. The CONSULTANT shall contact the MDOT 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 MDOT 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.

D. Condition Assessments

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

E. Aerial or Ground-Mounted Utility Facilities

If specified by MDOT in the Work Assignment, 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.

F. Unknown Lines

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 MDOT staff and/or other involved parties.
2. Submit monthly status reports in accordance with the MDOT Project Manager's approval.
3. Attend weekly/biweekly meetings between the MDOT and the construction contractor when the project goes to construction.

B. Preconstruction Utility Coordination

Coordination activities include but are not limited to:

1. Implement and comply with any utility coordination procedures indicated by the MDOT Project Manager.
2. Notify and furnish preliminary project data to involved utility owners.
3. Provide liaison among MDOT, 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 MDOT 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 the utility owners' and MDOT's approval, design and prepare plans and specifications for utility facilities to be relocated, or installed on the MDOT project.
2. Incorporate utility design information into project plans and furnish documentation to The MDOT Project Manager and/or utility owners as requested by the MDOT Project Manager.
3. Comply with applicable MDOT and/or utility design standards and MDOT utility accommodation policies.

E. Construction Coordination and Monitoring

1. Provide liaison among MDOT, 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

A. Records and Information Research

Conduct appropriate investigations (e.g., owner records, MDOT records, 811 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

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

Review records for evidence or Indication of additional available records; duplicate or conflicting Information; need for clarification.

D. Aerial or Ground-Mounted Facilities

Include records research, identification, and depiction of aerial or ground-mounted utility facilities in QL D tasks if specified in the Work Assignment.

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 the MDOT Project Manager.
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

A. Inclusive of QL D Tasks

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

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

Include survey and correlation of aerial or ground-mounted utility facilities in QL C tasks if specified in the Work Assignment.

D. Surveys

1. Survey surface features of subsurface utility facilities or systems, if such features have not already been surveyed by a Licensed Professional registered in Mississippi. Surveys must be completed in accordance with the latest MDOT Survey Manual unless otherwise stated by the MDOT Project Manager. 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

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

A. Inclusive of QL C Tasks

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 the MDOT Project Manager for marking of lines.
3. Utilize the uniform color code of the American Public Works Association for marking of utilities.
4. Unless otherwise directed by the MDOT Project Manager, mark the centerline of single-conduit lines, and outside edges of multi-conduit systems.
5. Unless otherwise approved by the MDOT Project Manager, 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 the MDOT Project Manager'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.

C. Surveys

1. Survey all markings that indicate the presence of a subsurface utility.
2. Perform surveys to a horizontal accuracy consistent with the latest version of the MDOT survey manual. Reference surveys to the project's survey control as established by MDOT.
3. Record depth information as may be indicated by the particular detection method used.

D. 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.

VII. Quality Level A Tasks

A. Inclusive of QL B Tasks

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

B. Selection of Test Locations

1. MDOT will 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 will 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 by the CONSULTANT 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 the MDOT Project Manager, 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. If required by the MDOT Project Manager, the 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 the MDOT Project Manager that such method poses minimal risk of damage to the highway facility or utility lines.

D. Compliance with the Mississippi 811 Call Requirements

The CONSULTANT shall comply with all applicable provisions of Mississippi 811 "Excavation Requirements", when planning or performing excavations at utility test hole sites.

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 by the MDOT Project Manager.
3. Excavate the test hole by the method(s) acceptable to MDOT 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 (75 mm) unless otherwise approved by the MDOT Project Manager.
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 MDOT survey standards.
4. Field sketch showing horizontal location referenced to a minimum of three 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 as required by the MDOT Project Manager.
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 reasonable 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 by the MDOT Project Manager.
2. Backfill and compact the excavation in a manner acceptable to the MDOT Project Manager. If approved, re-use excavated material with approved 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 the MDOT Project Manager.
5. Repair or replace backfill or pavement that fails (i.e., subsidence and/or loss of pavement material) within two years of the original restoration work.
6. For excavations in unpaved areas, return 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.

H. 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.