TR 2023-01 – Subsurface Utility Engineering (SUE)
Task Team Chairs – Kirk Kirkpatrick, Nick Zembillas
Proposals Approved by Task Team – October 2, 2023

PROPOSED MODIFICATION TO PRACTICE 2-14 *(Redline follows)*

2.14 Subsurface Utility Engineering (SUE)

Practice Statement:
When applied properly during the design phase, Subsurface Utility Engineering (SUE) provides significant cost and damage-avoidance benefits and the opportunity to correct inaccuracies in existing facility records.[19]

Practice Description:
In certain cases and environments, it may be difficult or impossible to determine the locations of all utilities and/or impediments with sufficient accuracy to avoid damage or delay during construction. In these cases, SUE is applied during the design phase to locate, identify, and characterize all existing utility infrastructure (and other relevant non-utility features) found within a given project/area. SUE is applied in a structured manner in accordance with practices and quality levels found in ASCE 38-22 "Standard Guideline for Investigating and Documenting Existing Utilities." The project owner dictates the required quality levels (QL) as well as the amount of effort expended by the SUE provider on each. Although the standard is more detailed and comprehensive, the following is a brief summary of the quality levels defined therein:

- QL-D involves utility records research and interviews with knowledgeable utility personnel.
- QL-C involves surface survey and identifying and recording aboveground features of subsurface utilities, such as manholes, valves, and hydrants.
- QL-B involves application of "surface geophysical methods," such as EM-based locating instruments, GPR, radar tomography, metal detectors, and optical instruments, to gather and record approximate horizontal (and, in some cases, vertical) positional data.
- QL-A involves exposure via "non-destructive soft digging" (vacuum excavation or hand-digging and provides precise horizontal and vertical positional data. SUE results are integrated into the design process, in which design engineers use the information to create construction plans that accommodate existing infrastructure, thereby reducing the overall risk of conflicts and/or damage.[1]

References:
- U.S. Department of Transportation—FHWA (12/1999). Cost Savings on Projects Utilizing Subsurface Utility Engineering. Pub. No. FHWA-IF-00-014
- U.S. Department of Transportation—FHWA (3/2001). Subsurface Utility Engineering: Enhancing Construction Activities. Pub. No. FHWA-IF-01-011
- ASCE 38-22 Standard Guideline for Investigating and Documenting Existing Utilities
- Pennsylvania state law – Underground Utility Line Protection Act of 1974 as amended

1. TR-2004-03: Amendment approved by the CGA Board on March 4, 2005

REDLINE MODIFICATIONS TO 2-14 BELOW

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- QL-D involves utility records research and interviews with knowledgeable utility personnel.
- QL-C involves surface survey and identifying and recording aboveground features of subsurface utilities, such as manholes, valves, and hydrants.
- QL-B involves application of "surface geophysical methods," such as EM-based locating instruments, GPR, radar tomography, metal detectors, and optical instruments, to gather and record approximate horizontal (and, in some cases, vertical) positional data.
- QL-A involves physical exposure via "non-destructive soft digging" (vacuum excavation or hand digging) and provides precise horizontal and vertical positional data.~~of a facility by safe excavation practices to ascertain the precise horizontal and vertical position of underground lines or facilities. Accepted safe excavation practices vary by state/local jurisdiction, but the preferred techniques include hand digging with extreme caution and/or vacuum excavation. (See Best Practice 5-32.)~~
- SUE results are integrated into the design process, in which design engineers use the information to create construction plans that accommodate existing infrastructure, thereby reducing the overall risk of conflicts and/or damage.[1]

References:

- U.S. Department of Transportation—FHWA (12/1999). Cost Savings on Projects Utilizing Subsurface Utility Engineering. Pub. No. FHWA-IF-00-014
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