



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.^{4/}

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 nonutility features) found within a given project/area. SUE is applied in a structured manner in accordance with practices and quality levels found in ASCE 38-02 “*Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*.” The project owner dictates the required quality levels 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 physical exposure via “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.^{5/}

References:

- U.S. Department of Transportation—FHWA (12/1999). *Cost Savings on Highway 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 38-02 *Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data*
- Pennsylvania state law

^{4/} TR-2007-02: Modification to statement approved by the CGA Board on August 24, 2007

^{5/} TR-2004-03: Amendment approved by the CGA Board on March 4, 2005