Subsurface Utility Engineering

Putting the Engineering in SUE

Understanding ASCE 38-02

Presented by:

Cardno

SoftDig

SO-DEEP
Outline

> Introductions
> Subsurface Utility Engineering (SUE) Overview
> ASCE 38-02
  • Definitions
  • Quality Levels
> How is ASCE Being Used?
> What is ASCE Doing Next?
> Questions
CI/ASCE Standard 38-02

The American Society of Civil Engineers (ASCE) has developed a National Consensus Standard, CI/ASCE 38-02, titled “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data”. This National Consensus Standard (NCS) is used by courts and lawyers, along with contractual instruments, to assist in both defining a professional’s standard of care and level of responsibility.
What is Subsurface Utility Engineering?
3.0 DEFINITIONS

Subsurface Utility Engineering (SUE): A branch of engineering that involves managing certain risks associated with utility mapping at appropriate quality levels ...
What is Subsurface Utility Engineering?

It is ...

> An engineering practice
> A professional engineering service
> Deliverables are signed and sealed by a PE

It is NOT...

> Survey of “Miss Utility” or One-Call Marks
> CAD File Depiction of Record Research
Definitions (from ASCE 38-02)

**Designating:** The process of using a geophysical method or methods to interpret the presence of a subsurface utility and to mark its approximate horizontal position (its designation) on the ground surface.
Definitions (from ASCE 38-02)

Locating: The process of exposing and recording precise vertical and horizontal location of a utility.

Minimally intrusive excavation method: A method of excavation that minimizes the potential for damage to a structure being uncovered.
Definitions (from ASCE 38-02)

**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.

- 4 Quality Levels – QL-D, QL-C, QL-B, QL-A
- These levels must be cumulative
- Each QL is defined in the Standard
ASCE Quality Level D (QL-D)
Existing Utility Records

Information derived from existing records or oral recollections.

- GIS Data
- Circuit Diagrams
- Valve Guides
- Record Drawings
- Field Notes
- Mtgs. w/ Staff
ASCE Quality Level C (QL-C)
Survey of Visible Features

Involves surveying visible above ground utility features and using professional judgment to correlate with the records (QL-D information)

> Manholes
> Power poles
> Hydrants
ASCE Quality Level B (QL-B)
Determining Horizontal Alignment

- Obtained through appropriate surface geophysical methods
- Reproducible in the field
- Surveyed to applicable tolerances
- Included with the survey to create base mapping
Miss Utility Information is Not Quality Level-B
Why is Miss Utility Information Not Quality Level-B?

- Miss Utility is a risk based system used for excavation
- Typical Miss Utility locator uses one piece of equipment
- The information received has no guarantee of accuracy
- Miss Utility locator has a narrow focus and limited by time
- Survey of inaccurate paint marks is not QL-B
Quality Level-B is ..... 

- Using Appropriate Methods (Inductive vs Conductive)
  - Inductive – inducing current along utility
  - Conductive – directly connecting to utility
- Using Appropriate Equipment
  - Single or multi-frequency electromagnetic units
  - GPR
  - Sonde or sonic methods
- Supported by QL-D and QL-C
- Guaranteed by a Professional Engineer
ASCE Quality Level A (QL-A)
Utility Locating

- Precise location by actual exposure
- Minimally intrusive excavation
- Accuracy to 0.04 feet
- Supported by QL-D, QL-C, and QL-B
ASCE Quality Level A (QL-A)
Appropriate Method of Utility Locating

> Comply with permitting requirements
> Comply with Miss Utility Law
> Vacuum Excavation Systems without Production Limitations
> Work Zone Safety
> Proper Restoration
ASCE Quality Level A (QL-A)

Gathering Appropriate Data

> Surveyed information
  • Horizontal and vertical location
  • Ground elevation

> Size and configuration
  • Pipe diameter
  • Width and height of ductbanks

> Resolve differences in Quality Levels

> Sign and seal with professional engineers seal (ASCE 38-02; 4.1.12)
### ASCE Quality Level - A SUE Deliverable

#### Sample Test Hole Data Form

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**Underground Services, Inc.**

400 North Main Street, Dept. 130
Lewes, DE 19958

William S. Niemietz PE PLS

**Ramesh C. Batta Associates, P.A.**

400 North Main Street, Dept. 130
Lewes, DE 19958

William S. Niemietz PE PLS
ASCE Quality Level - A SUE Deliverable

Sample Test Hole Data Form
How has the ASCE 38-02 BeenUsed?

- Best practice (FHWA, APWA, CGA, FAA, National Academy of Science, and others)
- Case Law increasing
- JUST IN: ASCE 38 NOW INCLUDED IN EJCDC ENG. DOCS
- Update imminent
What is ASCE Doing Now?

> The Revised Standard ASCE 38
  • Utility report requirement
  • Data to be GIS compatible
  • Miss Utility to be sub QL-D

> Working with NCEES on the following:
  • Workshops with state licensing boards
  • Non-professional use of the standard
  • State boards to prosecute misuse of SUE

> ASCE is committed to keeping SUE an Engineering Practice