

SUBSURFACE UTILITY ENGINEERING

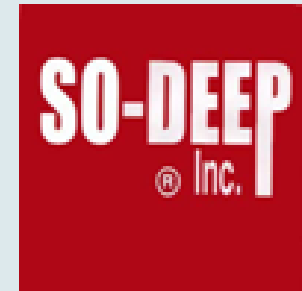
Standard of Care for Subsurface Utility Engineering

Bill Pickering, P.E.

District Engineer

Dave Cole, P.S.

Senior Vice President



SUBSURFACE UTILITY ENGINEERING

Standard of Care for Subsurface Utility Engineering

- It's Meaning
- Varying Scopes & Deliverables
- Meeting the Standard



Subsurface Utility Engineering (SUE)

DEFINITION: A branch of engineering practice that involves managing certain risks associated with:

- a.) utility mapping at appropriate quality levels.
- b.) utility coordination.
- c.) utility relocation design and coordination.
- d.) utility assessment.
- e.) communication of utility data concerned parties.
- f.) utility relocation cost estimates.
- g.) implementation of utility accommodation policies.
- h.) utility design.



THE STANDARD

ASCE 38-02 defines a subsurface utility engineer as:

A person who
by education and experience
is qualified to practice
subsurface utility engineering.



THE LAW

In Ohio, the Code of Ethics states:

- ▶ No person shall practice, or offer to practice, the profession of engineering or the profession of surveying without being registered.



SUBSURFACE UTILITY ENGINEERING

REQUEST FOR PROPOSAL

In Pennsylvania, a RFP may request services for subsurface utility engineering. It will require, in part, the following:

the selected firm will be required to provide professional utility mapping services in accordance with the standard of care of the subsurface utility engineering profession.



In General, The SUE Engineer Should:

Have knowledge about utilities to consider risk factors for the project.

Have knowledge of federal, state and local accommodation policies.

Be able to prepare a preliminary cost estimate.



In General, The SUE Engineer Should:

Have the ability to assist the owner in negotiating a scope of work that fits the project's needs.

Be able to produce mapping, identify potential conflicts with the design footprint and offer sensible and practical alternatives to the designer,

Be able to communicate information to the constructor using mapping deliverables, written reports and verbal briefings.



MEETING THE STANDARD

The Common-Law Standard of Care for Design Professionals is:

the duty to exercise the degree of learning and skill ordinarily possessed by a reputable design professional practicing in the same or similar locality and under the same circumstances.



POTHoles



COMMON MISCONCEPTIONS

The determination any method to measure an exposed utility is Quality Level A.

- The data must comply with appropriate survey standards and specifications and be sealed by a registered professional.



WANTED: FOR THIEFT OF S.U.E.

- ▶ **Subsurface**
- ▶ **Utility**
- ▶ **Exploration**



COMMON MISCONCEPTIONS

Quality Level B is:

- survey of One-Call marks.
- straight line between 2 exposed points.
- mark up & survey of record utilities.
- designating in active mode only w/ no cross sweeping in passive mode.

-the standard of care is met only when the complete investigation is performed under the direct supervision of the professional in responsible charge with a trained and competent staff following **ALL** quality assurance procedures.



TYPICAL MILITARY “SUE” SCOPE



*“Contractor shall perform
a Ground Penetrating
Radar (GPR) Survey of
All underground utilities.”*



Scopes of Work: **ENERGY**



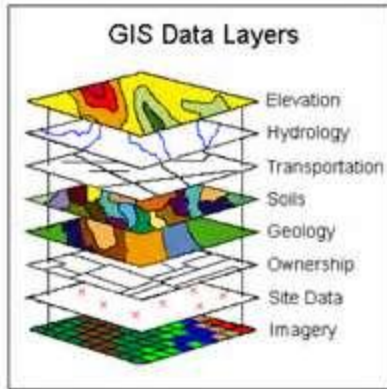
“Scanning (or Quality Level B service) ...”

“ Utility location accuracy based on scanning:

within 2.0’ horizontally & 0.5 foot vertically.”



Scopes of Work: GIS



- ▶ Utility Quality Level (UQL) B
- ▶ 4. Utilize pink paint to mark out water system facilities.
- ▶ 6. Maintain horizontal accuracy of +/- 0.5 feet in the marking of pipe centerlines.

NO PROFESSIONAL CERTIFICATION !!!



SUE PROVIDERS

“Quality Level B data accuracy is +/- 2 inches.”



EQUIPMENT

MINIMUM STANDARDS

“... work shall be performed with accepted methods of practice and Equipment capable of attaining the Tolerances...”

- Some Providers don't have GPR.
- Others want to charge extra for it.

GPR



EQUIPMENT



**“IT FITS IN THE
BED OF YOUR
PICKUP.”**

Vac Boring #1 was in asphalt pavement & our equipment was having difficulty getting through the pavement at other sites.

The OUPS utility locator was able to generate a signal on the HP gas line 5 feet north of our proposed boring.

At vac boring numbers 3, 4, 5, 9, 11 & 13 we encountered concrete and could not advance the depth of excavation.



CONTRACT ADMINISTRATORS

Price Pressures

treating SUE simply
As a commodity
instead of a
professional
service integral
to project
design



The Brooks Act & mini-Brooks Acts

Potential Contract Bidders,

As firms awarded an On Call Master Agreement for Subsurface Utility Engineering Services with the XXXXXXXXXX State Department of Transportation, you are invited to submit a proposal for SUE work on XXX project.

- ▶ The bid shall include individual pricing for each pothole
- ▶ The contractor shall provide a copy of the surveyors field book
- ▶ No Professional Certification





DESIGN-BUILD

DESIGN-BUILD



DESIGN-BUILD

CONTRACTOR



DESIGNER



SUE



MEETING THE STANDARD

The following are a list of questions to ask when discussing standard of care in subsurface utility engineering:

- 1.) Is the project under the direct management of a registered professional engineer or surveyor who is experienced in the profession of subsurface utility engineering.
- 2.) Do the personnel assigned to the project have the training and skills required to perform the assigned tasks?



MEETING THE STANDARD

- 3.) Is there a check-list of procedures for the quality assurance/review engineer to follow?
- 4.) Were proper field procedures followed in designating?
- 5.) Were the field records accurately researched?



MEETING THE STANDARD

- 6.) Was the survey conducted properly?
- 7.) Does the work product accurately reflect the existing field conditions?
- 8.) Is the job packet complete?
- 9.) Are the QL A test holes properly sited?



MEETING THE STANDARD

- 10.) Was the QL A test hole dug on the proper utility?
- 11.) Were quality assurance reviews performed independent from the development of the work product?
- 12.) Did the professional who is the project manager seal the work product?
- 13.) Can the engineer of record be confident of certifying the project as meeting the standard of care of the SUE profession?



QUESTIONS

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