CHAPTER 12

SUBSURFACE UTILITY ENGINEERING (SUE) DESIGNATION AND LOCATION

Chapter Contents

Sec. 12.01 Introduction

Subsurface Utility Engineering (SUE) involves managing risks associated with utility mapping at appropriate quality levels, utility coordination, and utility relocation design and coordination. These utility risks are managed by using designation and locating services to make sound engineering decisions.

Designation is defined as the process of using surface geophysical method or methods to interpret the presence of a subsurface utility and to mark its ***approximate*** horizontal location on the ground surface.

Utility location (Location or Test Holes) is defined as the process of exposing and recording the ***precise*** vertical and horizontal location of utilities (test holes).

The American Public Works Association (APWA) Uniform Code defines the following underground utilities with color coding:

electric power lines, cables, conduit, and lighting cables

telecommunication, alarm or signal lines, cables, conduit or other communication lines

natural gas, oil, steam, petroleum, or other gaseous or flammable material

sewers and drain lines (gravity and force)

potable (drinkable) water

reclaimed water, irrigation, and slurry lines

The terms utility or utilities used in this chapter and Appendix A are inclusive of all the APWA utilities listed above, either above or below ground.

The Department has statewide contracts with Subsurface Utility Engineering (SUE) consultants to designate and locate utilities on projects. These contracts also have GPR (ground penetrating radar), scanning, and CCTV available for use.

Sec. 12.02 Designation & Location Policy and Standards

Policy:

Interstate, Primary, Secondary, and Urban projects, requiring surveys, shall have all utilities designated by a SUE Consultant unless a waiver is requested from the State Utility Manager or Regional Utility Manager or the GeoSpatial Program Manager. Miss Utility markings are NOT to be used unless for study purposes only.

The SUE limits shall be developed from the survey coordination meetings outlined in Sec. 7.02 and Sec. 8.01 of this manual.

Right of entry will need to be secured prior to the commencement of any site visits per Chapter 4 of this manual and the Code of Virginia (Section **§33.2-1011)**. **Entry to railroad property must be coordinated through** the VDOT Right of Way and Utilities Division, **Rail Section**. It is the responsibility of the professional in responsible charge to ensure that all right of entry procedures are followed when and where applicable.

Prior to commencement of the survey and/or SUE, survey and SUE teams shall coordinate responsibilities, share primary control and MOT if economically practical.

The horizontal and vertical datum used to designate and locate utilities must match the datum and working units used for the survey.

All dgn files will be stored in the *"UPC\Project Design\Survey"* and all other files will be stored in the *"UPC\Project Documents\Survey\SUE"* for each project.

Under no circumstances shall the Survey or Subsurface Utility Engineering (SUE) teams duplicate location efforts of the subsurface utilities (above or below ground).

The SUE team is responsible for the location of all APWA utility features above and below ground unless agreed upon prior to commencement of the survey. One possible exception is shown below:

Wells, Septic Tanks & Drain fields (Private)

Private water supply and sewage disposal system shall be shown on each individually developed property unless the Department excludes this during the conduct of location scoping. If the facilities are a considerable distance from centerline, a note indicating how these properties are served may suffice.

These private utilities shall be the responsibility of the SUE consultant to locate unless the Department indicates otherwise. Private drain field locations are to be shown by the professional providing the designation. Survey teams should use the S file and SUE teams should use the SU file. Care should be taken to place all utility information on the appropriate Utility Level.

Standards:

The Department will follow the most current version of CI/ASCE 38-02 standard entitled "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data" and the requirements outlined in Appendix A of the Survey Manual:

Appendix A outlines VDOT's expected standards of practice for SUE locations and designations. This appendix explains the responsibilities of VDOT staff and SUE Consultants in the process.

In using this standard, it must be realized that this is not an all-inclusive set of rules and as situations are encountered, the Department depends on the skill and initiative of all employees and consultants to resolve, or have these situations resolved efficiently and practically.

Designation:

The horizontal location of existing subsurface utilities will be made by the consultant and the information will be returned to the department in the format outlined in Appendix A.

Overhead line locations with sag elevations shall be included unless specifically excluded by the Department. Unit rate pricing will only apply to subsurface utilities excluding gravity and overhead systems.

Location (test holes):

Test holes should be secured on all underground facilities, i.e., water and gas lines larger than 3" (75 mm), telecommunications (copper/fiber optics) and electric lines in conduit systems and sanitary sewer force mains when there are potential conflicts or as deemed necessary by Design, Hydraulic, Utilities, and RW Utility staff.

Direct buried (non-fiber) telephone or electric cables typically should not require test holes.

Service lines to properties should not be secured unless they are 6" (150 mm) or greater in size and/or as may be specifically requested by the Department.

Test holes should not be requested for gravity sanitary sewer facilities, unless the inverts of the manholes are not obtainable because of physical obstructions.

Test holes will not be requested for facilities where construction will require that the facility be relocated.

Sec. 12.03 Work Flow Process

Designation:

Survey:

1. PM-100 is used to establish the limits of mapping and authorize the topographical survey and the SUE designation. This also establishes begin and end dates for activity 31S (Location Survey). Additional requests are submitted on LD-261 if necessary.
2. All work is stored and delivered by the ProjectWise file system.

Utility Location (Test holes):

Scheduling

1. The Project Manager should request the Underground Utility Location (Test Holes) approximately 6 months prior to the scheduled Field Inspection in order for the evaluation of test hole data and necessary plan changes to be made before Field Inspection.
2. The Project Manager should minimize the request for test holes to one order, or one mobilization by the SUE consultant.

Determination

1. It is expected that the request for test holes will be based upon several factors one of which is hydraulic design. Additional test holes may be required when the hydraulic design is finalized.
2. Potential vertical utility conflicts shall be determined after all feasible horizontal design adjustments have been incorporated into the design.
3. When other Divisions need test holes, they are to submit their requests directly to the Project Manager for inclusion in their submission. Test Hole locations should be based on station and offset to the proposed construction centerline and/or by project coordinates.
4. The Project Designer with input from the project team shall clearly identify the location of test holes to be secured on the plan sheets. Test Hole locations should be based on station and offset to the proposed construction centerline and/or by project coordinates.
5. The Project Manager shall request that the Regional Utility Coordinator review the marked plans to ensure that all necessary data will be secured with the initial request.
6. The Regional Utility Coordinator should advise the Project Manager of any known utility relocations that are proposed which will negate the need for any test holes.
7. Determination is complete when the Project Manager and Regional Utility Coordinator are in concurrence with the requested test holes.

Requesting Locating (Test Holes) Information (Project or Non Project related):

1. The Project Manager shall submit the test hole scoping data per section Quality Level A (QLA) – Locations – VDOT responsibilities.
2. The Survey Manager will:
    a. Contact and provide the scoping data to the GeoSpatial Program Manager for a consultant. If a consultant has been on a project, the SOP should be to continue to use the same firm if available.
    b. Provide the scoping data to the selected consultant for the task with the survey control data for the project.
    c. Review the task request with the Project Manager and send NTP to the GeoSpatial Program Manager.
3. The GeoSpatial Program Manager will review the task request and give final NTP to the selected consultant.
4. Survey Manager will track the consultant progress by email or phone communication protocols.

Sec. 12.04 Data Distribution

When the test hole data has been secured, it will be uploaded into ProjectWise and an email transmitted (with a hyperlink to the ProjectWise location) directly to the Project Manager and/or the Requestor for their evaluation and incorporation into the roadway plans and for distribution to others as requested.

The data should include items outlined in the QLA section of Appendix A.

Sec. 12.05 Evaluation of Location (Test Hole) Data

The Regional Utility Coordinator in conjunction with the Project Manager shall review the test hole data secured and make an evaluation as to whether the facility is vertically in conflict or not.

Should there be a conflict between the utility and the proposed structure, ditches, roadway or entrance cuts, etc., or wherever test holes are dug, the Project Manager shall determine if changes can be made to eliminate the utility conflict.

If the design is changed, new test hole data may be required. Should such changes significantly increase the cost of the construction items, the Project Manager shall advise the Right of Way Division Utilities Program Manager, the State Utilities Engineer and the Local Project Program Manager, if applicable, of the estimated cost for proper disposition.
If the Regional Utility Coordinator determines that a utility adjustment would be warranted rather than a storm sewer change or if a utility relocation is proposed, the Regional Utility Coordinator shall advise the designer so that the storm drainage design can be finalized.

Sec. 12.06 Roadway and Utility Field Inspections

Distribution of Prints:

After Roadway P.F.I. and F.I. evaluation is complete and approval received, the appropriate changes must be incorporated into the plans. Any previous test hole data acquired shall be shown on the UFI plans.

The Project Manager shall distribute notification of where the plans are located in ProjectWise for the Utility F.I. in accordance with the Utility Field Inspection Form LD-428.

The computer plotted cross sections are to be located in ProjectWise along with the CADD plans.

The Project Manager/Consultant is to be notified of the Utility Field Inspection on all projects. Check the appropriate data on the Utility Field Inspection Form.

The Location and Design Division maintains the LD Forms and they are available for applicable projects at: http://vdotforms.vdot.virginia.gov/

Construction Plans:

Required utility adjustments will be determined by the Regional Utility Coordinator.

The utility test hole information will not be shown on the construction plan sheets, but shall be included on the detail drawings for retaining walls, bridge footings, signal structures, special design items, etc. Include any utility information that may be beneficial to the Contractor, (i.e., 17" (430 mm) between top of waterline and retaining wall footing, top of utility elevation, etc.). Caution must be exercised to ensure that the data being shown applies to facilities that will still be in place during the construction of the highway project.

Figure 12.1 S.U.E. Quality Levels

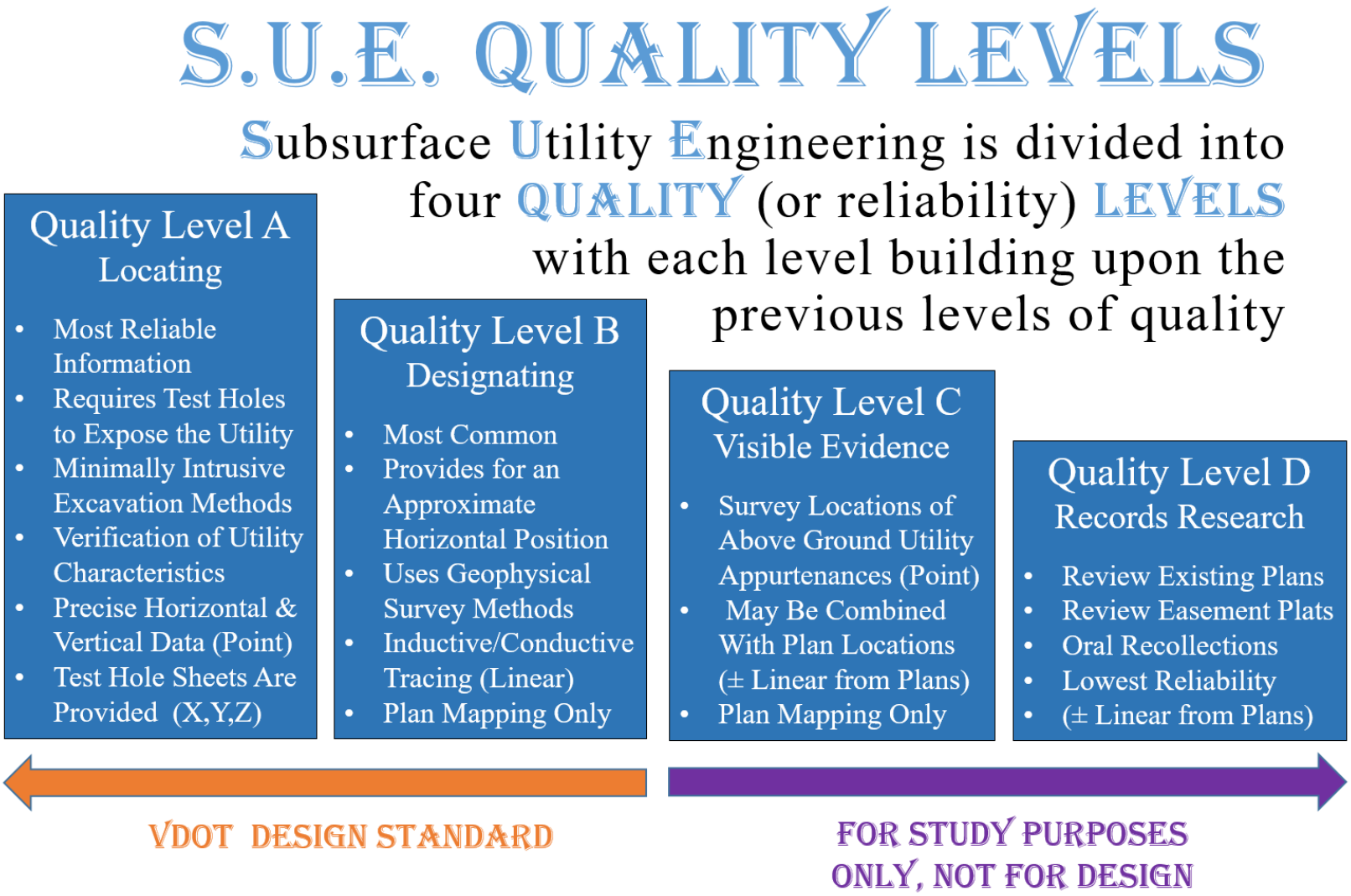

Figure 12.2 Miss Utility

MISS UTILITY 811

Miss Utility markings are NOT to be used for design purposes unless an exception is received.

Miss Utility DOES NOT meet the current ASCE 38 specifications and guidelines.

Miss Utility (811) Notification is still Required prior to Excavation per §56-265.17