

Appendix A – Standards of Practice SUE Locations and Designations

Deliverables:

All files shall be stored and delivered via the ProjectWise file system.

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.

Consultants will be granted access to these folders.

Quality Level A (QLA) - Locations

VDOT’s Responsibilities:

1. All proposed test hole locations will be reviewed and approved by Regional Utility Staff prior to submitting a request for task order to the Survey Manager or GeoSpatial Program Manager.

Proposed test hole locations shall be submitted in the suthreq(UPC#).dgn file.

A Test hole Inventory sheet (suthreq(UPC#).xls) shall be submitted as well. An example sheet is shown on the next page. A template inventory sheet is preloaded into project directories at “*UPC\Project Documents\Survey\SUE*” for each project.

Items/Columns marked **i-viii** shall be filled out prior to submittal to the Regional Right of Way Utility Staff. Please pay attention to the following items:

- vi. Plan Structure conflict with new construction.
 - vii. Depth of Target
 - viii. Point of Contact name, email address, and phone number for questions during the task order and field work phases.
2. Consultants will have access to the RW Utility Staff for questions and clarifications and will be provided contact numbers (viii) if questions arise in the field. Slot trenching will be approved by the RW Utility Staff.
3. The depth of target (vii) may be determined by the RW Utility Staff when the task order is submitted to the consultant.
4. Where possible, the proposed test hole locations should be located outside any existing paved driveways and concrete structures such as sidewalks and entrance aprons.

Example Sheet provided on next page.

SUE Consultant Responsibilities:

1. **Comply with the Underground Utility Damage Prevention Act, Title 56, Chapter 10.3**, Sections 56-265.14 through 56-265.32 of the Code of Virginia (2006), as amended, the provisions of which are incorporated by reference and with the most current version of ASCE Standard (CI/ASCE 38-02) entitled “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data”. Items outlined in this document are meant to supplement the ASCE 38.02.
2. The Consultant will be responsible for obtaining all applicable permits and rights of entry needed to perform utility designation/location. Right of Entry letters will be coordinated with the Survey Manager and the Survey Prime Consultant, if applicable. Right of Entry will follow procedures outlined in [Chapter 4](#) of the Survey Manual. As a courtesy, property owner contact shall be made onsite if location is on private property prior to digging test holes.
3. Miss Utility will be called prior to digging and all Miss Utility guidelines and procedures must be adhered to. These marks WILL NOT be used to target the facility for quality level A.
4. As-built and GIS records will be pulled and uploaded to the “**PROJECT DOCUMENTS\SURVEY\SUE\AS-BUILTS-RECORDS**” ProjectWise Folder. Note: There may be existing proprietary agreements in place that preclude the release of utility records to VDOT and shall be documented in the location report.
5. The consultant will utilize minimally intrusive excavation methods that include:
 - a. Prevention of damage to wrappings, coatings, or other protective covers.
 - b. Test holes should be neatly cut and are not to exceed 225 square inches. Authorization by the department is required when test holes greater than 225 square inches are necessary to obtain the diameter/size needed for larger pipes.
 - c. Trench excavation may be necessary when searching for non-detectable utilities and must be authorized by the department.
 - d. Where policies are governed by local agencies, the local test hole location procedures shall be followed.
6. On completion, test holes shall be restored to the following specifications:
 - a. Backfilled with select material.
 - b. Placed using proper techniques (compacting, lifts, etc.).
 - c. Provide permanent restoration of the pavement within the limits of the original cut.
 - d. Areas outside pavement will be restored to the condition prior to excavation.
 - e. Permanent restoration quality will be maintained for three years.
7. Test hole locations will be staked by field survey per the initial VDOT request, or as mutually agreed upon during the task order phase.

8. Utility Test hole locations:
 - a. For existing underground utilities shown on current SUE plans as Quality Level B, designations will be field verified prior to digging the test hole. If needed, the location of the test hole shall be adjusted to match the location of the utility designation. If a dry hole occurs, the department will be contacted immediately for direction based on items as outline in b. (i, ii, and iii).
 - b. For test holes requested on Level C and D utility mapping line work, a meeting (by phone or in person) will be held between the SUE consultant’s Project Manager and the VDOT’s District Utility Coordinator for the project to discuss options for attempting to locate previously un-located lines. Discussion should include:
 - i. An estimate for slot trenching will be included as an optional phase if a dry hole occurs for Level B, C or D. The slot trench shall be perpendicularly centered on the targeted facility and a minimum width of 2’ plus the diameter utility (2’ + D).
 - ii. Discussion of additional location methods that could be used such as Ground Penetrating Radar (GPR).
 - iii. These items should be outlined as separate phases on the task order request.
 - c. For test holes on previously un-locatable lines, the SUE consultant should request a meeting with the utility owner to discuss any help or additional information that they can provide.
 - d. If any discrepancies are found between as built plans and field conditions, then the consultant will be responsible for field adjusting the requested location of the test hole to target the facility.

9. Utility test holes will be photographed once the utility is uncovered. Photographs of the test hole (Pre, Utility, Post & Encasement structure) and the facility shall be included as part of the individual test hole reports submitted to VDOT.

10. The Utility Test hole Information spreadsheet provided in the scoping phase will be completed. The following information will be provided:

a. Field Date	b. Owner
c. Surface Type	d. Surface Thickness
e. Utility Size	f. Material of Utility
g. Northing/Easting	h. Existing Ground Elevation
i. Utility Field Depth to Top	j. Elevation(top of utility)

Approximate stations (iv) and offsets (v) shall be revised to reflect the correct values.

11. VDOT Utility Test hole sheets are required on all test holes. As-built test hole locations will be plotted electronically in the suth(upc#).dgn file. If the location of the utility changes significantly once the as-built data has been processed (+/- 2’), the Consultant will need to update their prior utility mapping “su” DGN file accordingly and submit it to the Survey Manager. If the QLA consultant did not provide the original “su” file mapping, the Survey Manager will be notified that the file will need to be corrected by the original firm.

12. All test holes will be marked with a permanent surface marker (hub & tack, PK nail) directly above the surface line of the structure. Surface line can be defined as centerline of singular circular utility, edge of duct or conduit. In all cases, the Consultant will provide sufficient detail/dimensions (to/from the surface marker) such that the designers can ascertain the limits of the targeted facility. Horizontal locations will be tied to the existing project survey control traverse. The vertical accuracy will be within an accuracy of +/- 0.10' based on the project benchmarks provided by the Survey Consultant or District Survey staff.
13. Utility test holes that do not find/recover the targeted facility, will be discussed with RW Utility staff immediately to determine the next course of action. Slot trenching may be necessary to locate the utility and shall be discussed with Utility staff immediately. This shall be documented to describe the efforts made to locate the utility. This documentation will be provided to the Survey Manager and the RW Utility contact indicated on the test hole inventory sheet.
14. Any meetings and communications with utility owners or field representatives will be documented and included in the location utility report. The SUE consultant shall be available to attend the UFI meeting if requested, a line item in the task order should be included for this effort.
15. The site will be left in a condition that is equal to, or better than before the test hole excavations commenced.
16. Provide a Location Utility Report (sular(upc#).pdf) in PDF format: A professionally sealed report that contains the following information in this order and location:

“UPC\PROJECT DOCUMENTS\SURVEY\SUE\REPORTS”

- a. The completed Test Hole Information sheet.
- b. Lists of all utility owners.
- c. All individual test hole sheets.
- d. Information about the utilities investigation.
- e. Documents for test holes that do not contain a utility, to include detailed explanations of the efforts performed to locate the facility, including the test hole dimensions.
- f. Any and all information that will assist the end user in understanding the subsurface utility landscape and risks.
- g. Recommendations that will address resulting data deficiencies.
- h. A Final Page to include any additional “su” DGN file notes not covered by items a-g and shall contain the professionals electronically signed seal.

Items b, d, and e, will be provided in the graphically sealed Deliverable as well.

Quality Level B (QLB) - Designation

VDOT's Responsibilities:

1. VDOT will furnish an exhibit outlining the SUE designations for the task order preparation. The SUE limits shall be developed from the survey coordination meetings outlined in [Sec. 7.02](#) and [Sec. 8.01](#) of this manual.
2. Unless instructed otherwise:
 - a. Quality Level B is requested for all applicable facilities.
 - b. There are no exclusions or exceptions of utilities.
 - c. Vaults will be shown with approximate dimensions found by physical inspection of the facility.
3. Consultants will have access to the Project Manager, Designer, and the RW Utility Staff for questions and clarifications and will be provided contact numbers.
4. The Department will provide access to highways plans, control data, benchmark data, and profiles if available.
5. The Department **WILL NOT** accept Miss Utility marks as the basis for Quality Level B (QLB) designations unless they have been field verified by the Consultant with methodologies outlined in the ASCE 38-02 for Quality level B designation.
6. All files to be stored under the "s" folder for the project.

Consultant Responsibilities:

1. Comply with the Underground Utility Damage Prevention Act, [Title 56, Chapter 10.3](#), Sections 56-265.14 through 56-265.32 of the Code of Virginia (2006), as amended, the provisions of which are incorporated by reference and with the most current version of ASCE Standard (38-02) entitled "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data". Items outlined in this document are meant to supplement the ASCE 38.02.
2. Will provide a KMZ file that outlines the limits of the SUE designation. Note: All utilities must extend 1 segment outside the KMZ limits submitted to VDOT.
3. All applicable utility records will be pulled and uploaded to ProjectWise, as appropriate. Note: There may be existing proprietary agreements in place that preclude the release of utility records to VDOT. The documentation of the responses from the Utility owners is needed and will be included in the designation utility report.
4. Utility research information received from the utility owners must be compiled, catalogued, and tracked. It is especially important that the utility information is readily available, shared amongst those who are authorized to have access to, and itemized in order to expedite the use and interpretation of the data.

5. Obtain all necessary permits from city, county, or municipality jurisdictions, to allow the Consultant to work in existing streets and roads for the purpose of marking, measuring and recording the location of existing underground utilities.
6. **Quality Level B (QLB) - The Consultant must obtain a reliable/repeatable geophysical signal that depicts the most likely utility location with regards to the specific utility system given all observed conditions, knowledge of utility systems configurations, and record data. This requires the use of more than one type of geophysical instrument, frequency, antenna, coupling technique or other variation to interpret a signal as reliable or repeatable.**
7. QLB - Using different grounding locations, different locator frequencies, different instruments, and different types of geophysics and getting similar (or different) results all contribute to the quality of the information and allow a person to decide that this specific mark is the best possible representation of the hidden underground utility. **Use of multiple methods is mandatory to achieve quality level B designation** and should be documented in the designation utility report.
8. A QLB data attribute can only be assigned to a Utility Segment when the following conditions are met: (a) the Utility Segment was detected through the application of appropriate Geophysical Methods; and (b) the geophysical signal was judged to be reliable; and (c) the interpreted position was judged, based upon knowledge of geophysical science, utility design and installation practices, and the influence of site conditions; and (d) the Designation has been tied to the Project Survey Datum with an accuracy of 0.2 feet.
9. It is a function of the Consultant to determine when records and features do not agree and to then resolve discrepancies. This may be accomplished by depiction of a utility line at Quality Level D (QLD), effectively bypassing or disregarding (but still depicting) a surveyed feature of unknown origin. Additional resolution may result from consultation with utility owners. The professional should consider such factors as the quantity of visible features, geometry of the features and record information, type of utility system, distances between features, and such other factors as they deem important in reducing portions of the depicted Utility Segments from QLC to QLD between surveyed Utility Features.
10. The Consultant's Professional judgment will be used to correlate the utility record data to the surveyed features, thus increasing the certainty of both utility location and existence. QLC should be only used for utilities where visible Utility Features can provide a reliable indication of the horizontal alignment (i.e. sewers, water mains, force mains). Some utilities, such as telecommunication cables, have surface features such as pedestals that do not provide a good indication of the horizontal alignment of the underground section of the utility except in the immediate vicinity of the structure and as such, using them as anchor points for a contiguous Utility Segment at QLC should be used with caution. When using surface features such as chambers/vaults/manholes, the lid must be removed to allow for visual confirmation of the location and function of the utilities in the structure to qualify any contiguous Utility Segments as QLC. Use of QLC or QLD will be documented in the designation utility report.

11. Vaults - Many times the symbol for a vault or manhole cover does not reflect the true dimensions, shape, position and orientation of underground space that is being used and may not be centered directly over a symmetrical space. Vault dimensions will be shown on the plans as measured by physical inspection of the facility if accessible. If the facility is not accessible, the Consultant is responsible for obtaining access to records to depict the facility accurately in the DGN file and on the correct quality level. When measurements are not possible, it shall be noted. If approximate dimensions can be determined, they should be shown with the source of the approximation documented in the DGN file and the designation utility report. All Vaults will be noted in the designation utility report.

Designation Utility Report (sudur(UPC#.pdf)) - The purpose of the DUR is to incorporate the utility report outlined in ASCE 38-02 with the additional information outlined below. The file will be stored in **“UPC\PROJECT DOCUMENTS\SURVEY\SUE\REPORTS”**.

The report will follow this format:

- a. Utility owners and their facilities within or near the project limits.
 - b. Utility owners and their contact information together with a compilation of the response communications.
 - c. Contain information about the utilities investigation that might otherwise not be conveyed.
 - d. Will show all notes in the DGN file and vault information outlined in 11.
 - e. QLC and QLD designations must be noted and explained in the report. Explanation should include the methodology for determining location as shown and recommendations to address the data deficiencies. This should be reviewed with the Department Survey and/or RW Utility staff prior to submittal.
 - f. This report will be signed and sealed and complements the graphical “su” DGN deliverable.
12. A MicroStation su(UPC#).dgn file must be submitted to the department with all utilities on the appropriate levels, correct symbology, and all notes.