

## Chapter 5

### Utilities

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## Chapter 5

### Utilities

#### 5.1 General

The designer is to make reasonable efforts to accommodate all existing utilities and any utilities to be constructed during the project. The designer is also responsible for identifying needed utility work (such as the removal, relocation, de-energizing, deactivation, or adjustment of utilities) and obtaining the agreements or orders to schedule this work. Consequently, coordination between the Department and the Utility Agency/Owner (UAO) is to be accomplished throughout the design process.

Utility work is necessary for but not limited to, the following conditions:

1. When utilities lie within the vertical and horizontal construction limits, plus the reasonably required distance for working room necessary for operation of equipment normally used for the particular type of construction, or for compliance with OSHA (**29 CFR Part 1926**), NESC or other regulations.
2. When utilities lie within the horizontal limits of the project and within 12 inches below the ground surface or the excavation surface on which the Contractor operates construction equipment, or within 12 inches below the bottom of any stabilizing course specified in the plans.
3. When utilities lie within the normal limits of excavation for underground drainage facilities or other structures. Such normal limits shall extend to side slopes along the angle of repose, as established by sound engineering practice, unless the Contract Documents require support of the excavation sides by sheeting.

Design features that reduce or avoid utility conflicts may be more expensive; however, those expenses may be offset by savings in construction time and the total associated savings for the FDOT project and the utilities. Additional guidance for accommodating utilities within the highway rights of way are given in the AASHTO publications ***A Guide for Accommodating Utilities within Highway Right-of-Way*** and ***A Policy on Geometric Design of Highways and Streets*** and in the TRB publication ***Policies for Accommodation of Utilities on Highway Rights-of-Way***.

## 5.2 Utility Work Schedules and Agreements

In order to certify the project in accordance with **Utility Work Agreements and Certification Process Topic No. 710-010-050**, the designer, with assistance from the District Utilities Office and the Office of General Counsel, will obtain the necessary **Utility Work Schedules (Form 710-010-05)**, relocation agreements, and any required payments to or by the Department for Utility Work. When an agreement cannot be obtained, the designer shall coordinate with the District Utilities Office and the Office of General Counsel to pursue any needed order to relocate.

Modification for Non-Conventional Projects:

Delete **PPM 5.2** and see RFP for requirements.

## 5.3 Utility Locates

It is the responsibility of the designer, with the assistance of the District Utility Office to determine the locations and Quality Levels necessary to obtain the needed utility information. The description of the information obtained from each Quality Level of locate is provided in **Section 5.3.1**.

It is the responsibility of the UAOs to provide Quality Level “D”, “C” and “B” locates on request. In some instances the UAOs can provide Quality Level “A” locate information.

Quality Level “A” locate information is to be obtained when proposed construction operations are suspected to be within three feet (3’) of major utilities. Major utilities are those underground and aboveground utilities that if damaged or required to relocate would cause high construction costs to the UAO, other utilities, or FDOT. The UAO may be able to provide this information; however, it is the responsibility of the Designer to obtain this level of information when needed and when the UAO will not be providing this information. The decision to proceed to construction without this information shall be made with consultation with the District Utility Office, appropriate construction personnel and the UAO.

### 5.3.1 Quality Levels for Utility Locates

The following identifies the key elements within the quality level of utility locates in ascending order about which Subsurface Utility Engineering is applied:

- Quality Level “D” - Existing Records
- Quality Level “C” - Surface Visible Feature Survey
- Quality Level “B” - Designating
- Quality Level “A” - Locating

A detailed description of the scope of work to be included to achieve the various Quality Levels follows:

Quality Level “D” locates are information obtained solely from a review of utility records for facilities that may be affected by the project. The comprehensiveness and accuracy of such information is highly limited. Even when existing information for a utility in a particular area is accurate, there are often other underground systems that are not shown on any records.

Quality Level “D” may be appropriate for use early in the development of a project to determine the presence of utilities. Applicable records may include previous construction plans in the area, conduit maps, direct-buried cable records, distribution maps, transmission maps, service record cards, “as-builts” and record drawings, field notes, county, city, UAO or other geographic information system databases, circuit diagrams, or oral histories. The records should be reviewed for indications of additional available records, duplicate information, and credibility of such duplicate information, and need for clarification by UAO’s. The end product of a Quality Level “D” would be a utility composite drawing or equivalent. The engineer should also make professional judgments regarding the validity and location of topographic features on records versus current topographic features (when available) and conflicting reference of utilities. The engineer should indicate the quality levels, utility type and/or ownership, date of depiction, accuracy of depicted appurtenances, end points of any utility data, active, placed out of service, size, condition, number of jointly buried cables, and encasement.

Quality Level “C” locates are information obtained to augment Quality Level “D” information. This involves topographic surveying of visible, above ground utility features such as poles, hydrants, valve boxes, circuit breakers, etc. If previously surveyed, check survey accuracy and completeness for applicability with the existing project. Correlate applicable utility records to the surveyed features, taking into account the geometries and indications on the records of these surface features. Determine when records and features do not agree and resolve discrepancies. Additional resolution may

result from consultation with UAOs. Quality Level “C” may be appropriately used early in the development of a project and will provide better data than Quality Level “D” information alone. Designers cannot be sure their design is appropriate nor can construction proceed without caution when using information for underground utilities based only on Quality Level “D” and “C” locates.

Quality Level “B” locates are information obtained to augment Quality Level “C” information. Quality Level “B” locates are information obtained through the use of designating technologies (e.g., geophysical prospecting technologies). This is an application using scanning technologies, most of which have very specific capabilities and limitations that vary with site conditions. Applying a variety of techniques is essential to the process of preparing a comprehensive horizontal map of utilities and other underground structures on the site. Designating technologies are capable of providing reasonable horizontal information but provide limited vertical information. Mark the indications of utilities on the ground surface for subsequent survey. Care should be taken to differentiate markings placed on the ground for design purposes from those placed on the ground for damage prevention purposes. Survey all markings that indicate the presence of a subsurface utility. This survey should be to the accuracy and precision dictated by the project’s survey control. Depict all designated utilities. Correlate the designated utilities’ depictions with utility records and/or surveyed appurtenances to identify utilities that may exist but were not able to be designated. Resolve differences between designated utilities and surveyed appurtenances. Recommend to the project owner additional measures to resolve differences if they still exist.

Quality Level “A” locates provide the highest level of accuracy of utility locations in three dimensions. This Quality Level may apply manual, mechanical, or nondestructive (e.g., vacuum excavation) methods to physically expose utilities for measurement and data recording. Quality Levels “B”, “C”, and “D” locates are incorporated in Quality Level “A” locates. The designer should obtain Quality Level “A” locates at highway/utility conflict points where verified information is necessary. Select an appropriate method of gathering data that will achieve the accuracies and precision required by the project. These accuracies are currently typically set to one half (0.5) inch vertical and to applicable horizontal survey and mapping accuracy as defined by the project owner. Excavate test holes exposing the utility to be measured in such a manner that protects the integrity of the utility to be measured. Comply with applicable utility damage prevention laws, permits, and specifications and coordinate with Utility and other inspectors, as required. Determine (a) the horizontal and vertical location of the top and/or bottom of the utility referenced to the project survey datum; (b) the elevation of the existing grade over the utility at a test hole referenced to the project survey datum; (c) the outside diameter of the utility and configuration of non-encased, multi-conduit systems; (d) the utility structure material composition, when reasonably ascertainable;

(e) the benchmarks and/or project survey data used to determine elevations; (f) the paving thickness and type, where applicable; (g) the general soil type and site conditions; and (h) such other pertinent information as is reasonably ascertainable from each test hole site. Resolve differences between depicted Quality Level “A” data and other quality levels.

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