

## Chapter 5

### Utilities

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## Chapter 5

### Utilities

#### 5.1 General

The Department has the responsibility to maintain state highways as necessary to preserve the integrity, operational safety and function of the highway facility. Since the manner in which utilities cross or otherwise occupy highway right of way can materially affect the safe operation, maintenance and appearance of the highway, it is necessary that such use of the right of way be authorized and reasonably regulated. By Florida **Statutes 337.401** through **337.404**, utilities, whether public or privately owned, aerial or underground are permitted by the Department to be accommodated within the right of way on the State Highway System in accordance with the most recently adopted **Rule Chapter 14-46 Florida Administrative Code (F.A.C.)** and **Utility Accommodation Manual (UAM), Topic NO. 710-020-001**. Since **Rule Chapter 14-46** and the **UAM** establish the actions required of a utility agency/owner (UAO) and the Department in regards to utility accommodation, the **UAM** controls where differences occur between the **UAM** and the **PPM**.

During the design process, coordination with utility owners is required for removal, relocation, de-energizing, deactivation, or adjustment of utilities. This may include but is 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.

The designer should make every reasonable effort to design a project that will

accommodate all existing utilities and new utilities to be constructed concurrently with the project. The selection of typical section features, horizontal alignment and location of storm drain lines are areas that can sometimes be varied without violating safety standards and design criteria. 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***. The use of Subsurface Utility Engineering may also be used to facilitate utility related cost savings.

Selection of the methods to be employed within the Subsurface Utility Engineering (SUE) discipline should be considered in the scoping process. Relying totally on designating and selectively exposing utility facilities will seldom prevent all utility related delays in construction nor will it prevent the need for redesign. Consulting a state of the art SUE provider early on is the best way to determine the most cost effective approach. Determining the location of utilities when they are great in number or are in intersections is the most problematic and risk prone area within a project. These areas especially lend themselves to being candidates for newer technology locating services because they can reflect changes in shape and alignment not seen with traditional methods. The data gathering process can be less disruptive to the facility user and is non-destructive. A knowledge of potentially limiting environmental conditions is essential to the process. No single method is cost effective when risk versus benefit is measured.

## 5.2 Utility Accommodation Manual

UAOs are required to obtain permission for the installation and maintenance of utility facilities within the right of way of any State Highway System. Permission will be issued by FDOT in conformance with the ***Utility Accommodation Manual***. This includes utility work required by FDOT projects. The designer may be involved in the coordination of this process.

The Department's ***Utility Accommodation Manual*** is established to regulate the location, manner, installation and adjustment of utility facilities along, across, under or on right of way under the jurisdiction of the FDOT. This manual also establishes the process for issuing permits for such work which is in the interest of safety, protection, utilization and future development of the highways with due consideration given to public service afforded by adequate and economical utility installations as authorized

under **Section 337.403, Florida Statutes** and **Florida Administrative Code Rule 14-46.001**. Adherence shall be required under the circumstances set forth in the **Utility Accommodation Manual**.

### 5.3 Location of Existing Utilities

It is the responsibility of the design engineer with the assistance of the District Utility Office and construction personnel to determine the locations and levels of locate where utility information is needed. Quality levels of locates are identified in **Section 5.4**. 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. If Quality Level “A” locate information is necessary and cannot be provided by the UAOs, the measurement and documentation for the Quality Level “A” locate will be obtained by the FDOT, consultants, or others by established agreement.

Existing major underground utilities which are suspected to be located within three feet (3') of proposed construction operations which would threaten the utility should be considered for Quality Level “A” locate information. The decision to allow utilities to remain within three feet (3') of new construction operations should be made by the Design Engineer in consultation with the District Utility Office and appropriate construction personnel.

### 5.4 Quality Levels of 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.

## **5.5 Subsurface Utility Engineering**

Subsurface utility engineering (SUE) is more than an established engineering technology that can provide horizontal and vertical locations of underground utilities to produce an accurate picture of underground infrastructure. It is a branch of engineering practice that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation, design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of accommodation policies and utility design.

The scope of services and level of effort is established in the quality levels of

information to be provided. The quality level is a professional opinion of the quality and reliability of utility information desired or provided. Each of the four established quality levels is established by different methods of data collection and interpretation.

## 5.6 Coordination Process

Coordination between the Department and the UAOs is to be accomplished throughout the design process through the District Utility Office. Refer to **Chapters 13** through **16** of this volume for the design and review processes. For requirements on conflicts and permits, see the **Utility Accommodation Manual**.

External agency coordination may also be required when utility issues impact other agency agreements regarding permits or plans reviews.

Special coordination is required if during the plans design process it is determined that a potable water supply line must pass through a storm drain structure. Refer to **Rule Chapter 62-555.314 F.A.C.** and **Design Standards Index 307** for notification requirements and accepted methods of addressing conflicts. Failure to comply could result in work stoppage.

Submittals to UAOs shall include a sheet that summarizes the changes to the plans and design (since the previous submittal) that could potentially impact the UAOs. Only those changes are required to be summarized. A “Notes to the Reviewer Sheet” will satisfy this requirement.

Utility Work Schedules (**Form 710-010-05**) are to be executed with each UAO to schedule any utility work the contractor will not be contracted to perform. This work includes, but is not limited to, relocation, removal, adjustment, deactivation, de-energizing, or protection of the UAO’s facilities. Form **710-010-05** is to be submitted for each affected Utility with the plans as part of the bid package. This form can be found on the State Utilities Office web site: <http://www.dot.state.fl.us/rddesign/utilities/>