CHAPTER 12 – INSTALLATION OF UTILITIES AND OTHER SYSTEMS
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CHAPTER 12 – INSTALLATION OF UTILITIES AND OTHER SYSTEMS

12.1 GENERAL

This chapter sets forth the criteria and location requirements for all utilities, such as: water, sanitary sewer, storm sewer, subdrains, power (electric and natural gas), phone, CATV, traffic signals and mailboxes, within the right-of-way and/or public utility easements. The appropriate utility and the Local Entity's utility department shall determine all final alignments of utilities.

12.2 DESIGN STANDARDS

12.2.1 General Requirements

Standard plan requirements and layout requirements are discussed in **Chapter 3, Information Requirements for Construction Plans.** Refer to **Figure 12-1** for general utility requirements. Refer to Local Entity's Water and Wastewater requirements.

12.2.2 Minimum Depth

All utilities shall be located at least 2 feet below the scarified subgrade elevation, unless specifically approved to be less by the Local Entity Engineer. Greater depth of cover may be specified by the Local Entity Engineer.

12.2.3 Access Covers

A. Clearance

All manhole lids, utility access covers, and range box access covers shall be flush with the roadway finished surface or depressed no more than ¼ inch below the finished surface. If located in concrete, all access covers shall be set flush with surrounding concrete. Refer to **Drawing 1201**.

B. Wheel Path

Manholes or valves shall not be designed or constructed in the wheel paths of the travel lane or at any location within a bike lane.

C. Access Cover Location

Manhole, water valve or other utility access covers and lids shall not be located in the flowline of curbs, aprons or crosspans. Manholes and water valve covers shall be located more than 4 feet away from the curb or crosspan.

12.2.4 Trees and Large Shrubs Prohibited Over or Near Utilities

A. Buried Utilities

Trees, berms or large shrubs shall not be placed over buried utilities. Additional horizontal clearances from the trunk of any tree or shrub to any buried utility may be required by the Local Entity's utility department.

B. Overhead Utilities

Trees should not be planted under overhead power lines when mature growth of the tree would come within 10 feet of the power lines.

12.2.5 Use of PVC Sleeves by Franchised and Private Utilities

A. General

It is the intent of these standards to reduce the amount of open cuts in the roadway. Therefore, franchised and private utility companies shall install all utilities within a non-corrosive sleeve equivalent to Schedule 40 PVC or other sleeves encased in concrete, slurry or flow-fill material, across all public streets to accommodate future repairs without street cuts. PVC sleeves shall conform to **Construction Drawing 1202**.

B. Exceptions

Steel gas line street crossings will not require sleeves.

C. Depth

Sleeves shall be installed at a minimum depth of 36 inches from the top of the pipe to the top of pavement or 24 inches from the top of pipe to the top of subgrade, whichever is greater.

D. Location

Sleeves shall be located within 15 feet of the parallel gutter flowline of the existing street and shall be coordinated with other utilities. All sleeve locations shall be marked according to **Chapter 22, Construction Specifications**. Sleeves shall be separated for existing buried utilities in accordance with the utility owner requirements. Ten feet of separation is typically preferred. Private utilities shall be outside of the ROW unless otherwise approved by the Local Entity Engineer.

E. Street Cuts

Utility crossings of existing streets shall be performed in accordance with **Chapter 25, Reconstruction and Repair**.

12.2.6 Use of PVC Sleeves for Potential Signalized Intersections

A. Extra PVC Sleeves

Extra PVC sleeves may be required by the Local Entity on Collector or Arterial intersections for future traffic signalization.

12.3 LOCATION CRITERIA

Refer to **Figure 12-1** for general notes about Utility locations within street rights-of-way.

12.3.1 Utilities

A. General

The utility locations discussed below are required for new development and preferred in the case of existing streets/established developments.

B. Water

1. Water Mains. Water mains should be located on the north and east sides of streets approximately 7 feet south or west of the north or east gutter flowline. Water mains shall be separated by a minimum of 10 feet horizontally from sanitary sewer and storm sewer facilities.

2. Fire Hydrants. Fire hydrants shall be located 2 feet minimum from curb and gutter flowline or 2 feet minimum from back edge of a sidewalk or 10 feet minimum from edge of pavement if no curb is present. In addition, the water line shall be located such that the valves will not be in the wheel path of the street lane.

3. Requirements. The vertical depth of the water lines shall meet the requirements of the Local Entity's utility department.

C. Sanitary Sewer

1. Location. Sanitary sewer should be on the centerline of the right-of-way unless a median is present. If a median is present, the sanitary sewer line shall be located 6 feet west or south of the median. The sanitary sewer shall be located such that the manhole locations are not within the wheel path of the street lane.

2. Requirements. The vertical depth of the sanitary sewer lines shall meet the requirements of the sanitary sewer standards of the Local Entity.

D. Storm Sewer

1. Location. The storm sewer shall be placed so the manhole locations are not within the wheel path of the street lane.

2. Requirements. The storm sewer lines shall meet the requirements of the storm sewer standards of the Local Entity.

E. Natural Gas

1. Location. Gas mains shall be located either within the right-of-way or in an adjacent easement on the south and west sides of the street.

2. Double Mains. For double mains (a main on each side of the street), the requirement of north and east/south and west may be waived by the Local Entity Engineer. Double mains are recommended.

F. Power and Street Lighting

1. Location. Generally, power and street lighting lines shall be located on both sides of the street either within the right-of-way or in an adjacent easement.

2. Double Mains. Double mains are common and acceptable.

12.3.2 Other Systems

A. Broadband, Fiber Optic, Communications, Cable TV, Telephone, etc.

Cable TV and telephone lines generally serve properties from the back. For mains along the street front the utility shall coordinate the location in the right-of-way or easements with the Local Entity Engineer. All pedestal boxes located in the right-of-way between the curb and the sidewalk shall be installed below ground. Refer to Local Entity's regulations for other systems (broadband, fiber optic, communications, wireless communications, cable TV, telephone, small cell, etc.)

B. Mailboxes

Mailbox clusters must be installed a minimum of 2 feet from back of walk and not cause any sight obstruction. Mailboxes must not pose a fixed object hazard for vehicles and pedestrians.

C. Poles

1. Location. Poles, signs, and any other above ground streetscape (except regulatory signs) should be located within 5 feet of the right-of-way line or 10 feet from the travel lane (flowline), whichever is most restrictive.

2. Clearance. Light poles shall be placed no closer to the roadway than 2 feet behind a vertical curb line and no closer than 2 feet to any sidewalk.

3. Pole Requirements. The Local Entity Engineer may require breakaway poles on public right-of-way where speed limit is 40 m.p.h. or higher. Refer to **CDOT Roadway Design Manual, Section 1002.6, Specifications**.

4. Engineer Approval. All poles within the public right-of-way must be accepted by the Local Entity Engineer prior to the permit application for installation.

5. Other Requirements. All signs and heights shall meet the requirements of **Chapter 14, Traffic Signals, Signs, and Striping**.

D. Subdrains

Subdrain main lines may be permitted within the public right-of-way. The Developer shall be required to provide additional information and soils investigation, as discussed in **Chapter 5, Soils Investigations and Report**. In addition, subdrains shall be designed in accordance with the requirements in **Chapter 7, Street Design and Technical Criteria**. If the soils investigation shows that subdrains are required for private property foundations, these lines may be designed to be installed within the public right-of-way only if all requirements of these Standards are met.

1. Private Property. Subdrains built within the right-of-way for private drainage shall be private improvements and shall have provisions for viable maintenance by the local homeowners association, Metro District, or other private entities. If the system is deemed non-functional by the City, the HOA or Metro District will be informed in writing of the needed maintenance or repairs and the schedule for this to be completed. The Local Entity may require the private entity to abandon or relocate such subdrains.
2. Public Property. A subdrain is public if it is used to drain public improvements, such as the street/pavement section.
3. Requirements. The subdrain design shall meet or exceed these minimum requirements:
    a. Depth. Top of pipe shall be at least 36 inches below pavement surface.
    b. Outlet. All subdrains shall outlet to a detention pond, inlet, or other approved location. Each outlet shall have a device to prohibit backflow into outlet pipe.
    c. In Loveland. Perforated subdrains for private improvements shall not be allowed within any public right-of-way or easement.
4. Professional Engineer. Subdrains must be designed by a Professional Engineer and are subject to approval of the Local Entity Engineer.

12.3.3 Utility Crossings with Bridge Structures

Sleeves may be required within the bridge structures to provide for electrical, gas, telephone, fiber optic, broadband, wireless communications, and cable crossings, etc. The Local Entity Engineer may require additional sleeves to be designed with the bridge structure for sewer, water, or other utilities.