

## **SECTION 3.0**

# **SPECIFICATIONS FOR DRINKING WATER DISTRIBUTION SYSTEMS DESIGN**

### **3.1 GENERAL**

- 3.1.1 The following specifications cover the general design, review of plans and specifications, and acceptance of drinking (potable) water distribution systems, water main extensions, and all appurtenant items which are to be constructed by private enterprise and are to be owned and maintained by Hillsborough County.
- 3.1.2 The Public Utilities Water Resources Department (WRD) Technical Specification 331001 “Water Mains & Appurtenances” will provide additional clarification regarding design details, materials of construction, installation, and acceptance requirements. If further clarification is needed, contact the Site Engineering Review Section of the Development Services Department (DSD) or the Utility Design Section of WRD.
- 3.1.3 All improvements and modifications made to the Hillsborough County water system must be done in accordance with plans approved by the Site Engineering Review Section of the DSD. Material, workmanship, and installation must comply with Public Utilities WRD Technical Specification 331001.
- 3.1.4 All pipeline and appurtenance materials in contact with potable water must be NSF-61 certified.

### **3.2 PLANS PREPARATION**

- 3.2.1 All water distribution systems, water main extensions, and all appurtenant items must be designed in accordance with the applicable regulations of Hillsborough County, the Hillsborough County Department of Health (HCDOH), the Florida Department of Environmental Protection and the standards established herein.
  - 3.5.2.1 Hillsborough County WRD will own and maintain all portions of the water system up to and including the water meter.
  - 3.5.2.2 When the distribution main will serve existing or future developments beyond the borders of the proposed site, the County may request oversizing. If the County determines that a line needs to be Oversized, the procedures for sizing and reimbursement, as outlined in Appendix 3, must be followed.
- 3.2.2 The distribution system or any portion thereof, which is to become the property and sole responsibility of Hillsborough County WRD, must be designed and constructed within a public right-of-way or easement which may be used for said purpose. The primary feed for the distribution system must be routed within County Road right-of-way. A secondary feed may be routed within a utility easement dedicated to the County (design exception).
- 3.2.3 The water distribution system or water main extension must be designed and constructed in accordance with the requirements specified in Public Utilities WRD Technical Specification 331001.

### **3.3 PLANS REVIEW**

- 3.3.1 For subdivision development, the Developer must comply with the procedures and requirements set forth in Article VI, Part 6.02.00 of the County's Land Development Code. This includes requirements for submittal, review, and approval of a preliminary plat of the proposed project and potable water master plan. The placement of appurtenances in Hillsborough County right-of-way must be as required in the Utility Accommodation Guide and Rights of Way Use Procedures Manual.

- 3.3.2 For site development, the Developer must comply with the procedures and requirements set forth in Article VI, Part 6.03.00 of the County's Land Development Code. The Developer must submit plans and associated documentation to the Site Engineering Review Section of the Development Services Department for review. This department will either accept or reject the plans with notations for corrections required. All plans must comply with the requirements of the Hillsborough County Public Utilities WRD Technical Manual Section 2.0.

### 3.4 PROJECT ACCEPTANCE

Following completion of construction and testing, the Developer's Engineer of Record must submit certified "Record" drawings and the Asset Data spreadsheet with the "as-built" information shown on the original design as outlined in Section 1.6 and Section 2.4. Information required on a "Record" drawing of a typical water collection system is shown in Figure 3-1.

### 3.5 SYSTEM DESIGN AND FLOW CRITERIA

- 3.5.1 The provisions of this Section set forth the general requirements for the design of potable water distribution systems and facilities; and provide criteria for determining flow demands. The Engineer must comply with all the requirements of the Hillsborough County Health Department in addition to the criteria contained herein.
- 3.5.2 Line Sizing Criteria: Pipe sizing design criteria for water distribution systems must as a minimum provide for 100% of the combined peak hour, maximum day demand rate, plus fire flow. The minimum service pressure under said design criteria must not be less than 20 psi, or 35 psi in a transmission line. The minimum level of service for conditions without fire flow is 40 pounds per square inch (psi). Design flows and method of computation must be submitted to DSD for review by the WRD Utility Planning Team at the time of the preliminary plat or site plan submittal, or at the time of the Master Plan submittal. If the County determines that a line needs to be "Oversized", the procedures for sizing and reimbursement, as outlined in Appendix 3, must be followed.
- 3.5.3 Minimum Line Size: The minimum pipe size for distribution mains is four inches, with the exception that the minimum size for distribution mains serving fire hydrants and fire hydrant branches must be a minimum of six inches in diameter.
- 3.5.4 Line Routing
- 3.5.4.1 The primary feed for the water distribution system for a residential or commercial subdivision must be routed within County Road right-of-way. A secondary feed may be routed within a water, wastewater, or reclaimed water utility easement that is dedicated to the County (design exception), only if there is no road right-of-way available. Multiple points of connection may be required to minimize service outage in emergencies, repairs, etc., and to improve fire protection and water quality.
- 3.5.4.2 The County requires a project's off-site infrastructure to be extended beyond the development point(s) of connection in the right-of-way to the extent of the development's property. As a minimum, at the entrance to the project, the off-site main extension must be extended within the right-of-way with a valve and one length of pipe with a cap.
- 3.5.4.3 Refer to the Hillsborough County Public Works Transportation Technical Manual Drawings, latest edition, for the Recommended Utility Locations, TS-1.
- 3.5.5 Depth of Cover:
- 3.5.5.1 Cover as measured from finished grade to top of the pipeline must be a minimum of 36 inches for pipe diameters up to and including 12 inches.

- 3.5.5.2 Depth of cover must be a minimum of 48 inches for pipes greater than 12 inches in diameter, AND for all pipe in FDOT right-of-way, County arterial road right-of way, or crossings of these roads.
- 3.5.5.3 When automatic air release valves are required for pipe diameters up to and including 12 inches, the depth of cover of the entire line must be increased to a minimum of 48 inches (to maintain the valve vault flush with the existing or proposed grade).
- 3.5.5.4 Deeper burial depths for pipes 16 inches in diameter and larger may be required to accommodate valve height. Alternative valve orientation requires approval of the Department.
- 3.5.6 Flow Criteria
  - 3.5.6.1 Residential Flow Demand: Flow demands for design must be calculated based on full or projected ultimate development. The average daily flow (ADF) for single family and master-metered residential developments must be the per unit demand factors contained in the most current Utility Rate Resolution. Peaking factors for design must be based on total ERCs per Table 3-1.

**Table 3-1: Water Flow Peaking Factors**

| ERC   | Population (Thousands) | Peak Factor |
|-------|------------------------|-------------|
| 1     | 0.0027                 | 4.46        |
| 10    | 0.0270                 | 4.36        |
| 100   | 0.2700                 | 4.10        |
| 200   | 0.5400                 | 3.96        |
| 300   | 0.8100                 | 3.86        |
| 500   | 1.3500                 | 3.71        |
| 1000  | 2.7000                 | 3.48        |
| 2000  | 5.4000                 | 3.21        |
| >5000 | 13.5000                | 2.82        |

- 3.5.6.2. Commercial Flow Demand: Flow demands for design must be calculated based on the appropriate estimating factor found in Table 1 of the most current Utility Rate Resolution. Peaking factors for design must be based on total ERCs per Table 3-1.
- 3.5.6.3. Fire Flow: Fire flows must be calculated in accordance with the fire flow requirements specified by Insurance Services Office (ISO) based on population, density, and hazardous features of the proposed construction. The minimum residual pressure at peak hour, maximum day demand condition, plus fire demand must not be less than 35 psi for transmission mains and 20 psi for distribution mains.
- 3.5.7 Connection Feasibility: Contact the WRD Utility Planning Team to determine the feasibility of connecting developments of three ERC's or less.
- 3.5.8 Well Capacity: If County water service is not available, private wells should be designed to provide a capacity of maximum day demand with the additional consideration that combined with storage the entire system must be capable of producing flows of peak hour, maximum day demand, plus fire flow. Where the design of the system for fire flow is not practical, alternative means of providing fire flow such as dry hydrants may be used subject to approval of the DSD Site Engineering Review Section and the County Fire Marshal's Office.

### 3.5.9 Fire Hydrant Spacing, Location, and Flow

- 3.5.9.1 Manufacturing and Industrial Areas: Fire hydrants must be placed every 300 feet along the right-of-way with a maximum of 150 feet to the last lot. The minimum required fire flow must be 1000 gpm, provided by either: 1) each hydrant individually, or 2) multiple hydrants flowing simultaneously. The required fire flow will be determined by the County Fire Marshal's Office as part of the preliminary plan review process. Hydraulic capacity of the system may be able to provide fire flow above the 1000 gpm minimum, but any required fire flow not provided by the system must be provided onsite.
- 3.5.9.2 Commercial and Apartment Areas: Fire hydrants must be placed every 500 feet along the right-of-way with a maximum of 250 feet to the last lot. The minimum required fire flow must be 1000 gpm, provided by either: 1) each hydrant individually, or 2) multiple hydrants flowing simultaneously. The required fire flow will be determined by the County Fire Marshall's Office as part of the preliminary plan review process. Hydraulic capacity of the system may be able to provide fire flow above the 1000 gpm minimum, but any required fire flow not provided by the system must be provided onsite.
- 3.5.9.3 Residential Areas: Fire hydrants must be placed a maximum of 500 feet apart along the right-of-way with a maximum of 500 feet to the last lot. The minimum flow from each hydrant must be 750 gpm.
- 3.5.9.4 Other Areas: Fire hydrants must be placed a maximum of 1,000 feet apart, along the right-of-way of rural roads or other areas as approved by the County on a case-by-case basis.

### 3.5.10 Water Quality

- 3.5.10.1 To maintain water quality, dead-ends and looped systems require a fire hydrant, blow-off, or auto-flusher. A looped system is any single feed into a property that connects back into itself, or a distribution line installed in a circle.
- 3.5.10.2 New Developments that do not require a Master Plan submittal, but have more than 100 residential units, shall be reviewed by the Utility Planning Section and working with the Environmental Programs Section to determine the need and location of Dedicated Sampling Taps.

### 3.5.11 Temporary Water Service for Construction and Clearance of WRD Infrastructure

- 3.5.11.1 The provisions set forth herein are applicable to all construction projects. The developer will be responsible to submit a water plan (Plan). The Plan must describe how water will be provided for the construction of the WRD infrastructure. The Plan must be submitted to the Development Services Department along with the required construction plans.
- 3.5.11.2 Water service for WRD infrastructure construction must be supplied using a temporary construction assembly as described in Public Utilities WRD Technical Specification 331001.

- 3.5.12 Water Service for Fire Protection: Fire Protection using County Infrastructure must be from a potable water line, 6-inches or larger, cleared by the HCDOH. Alternate water sources for fire protection must be approved by the Fire Marshal.

3.6 WATER DETAILS

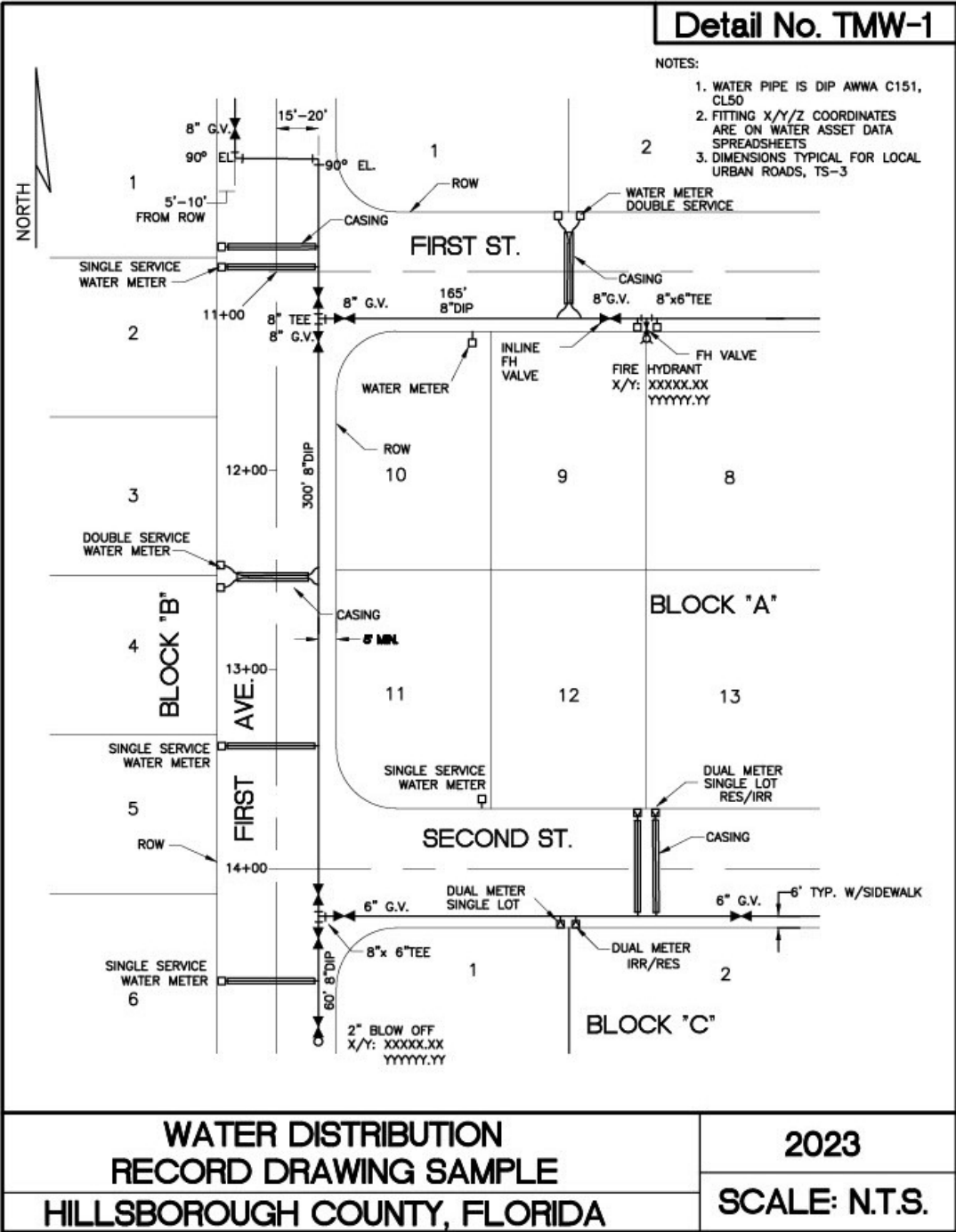


Figure 3-1: Water Detail No. TMW-1