

The following revisions to the Utilities Standards and Specifications Manual, 2<sup>nd</sup> Edition, have been approved by the City of Sanford's City Commission by Resolution 2023-3186 with an effective date of December 11, 2023. The revisions shall replace or add to the existing Manual as designated. The new or revised Figures in Part III "Standard Drawings" shall be provided as soon as possible once they are finalized by the Utilities Division staff.

**SECTION 11**  
**PLAN REVIEW, APPROVAL, CONSTRUCTION, AND ACCEPTANCE OF WATER**  
**AND WASTEWATER IMPROVEMENTS**

11.2.4 MAINTENANCE, MATERIALS, AND WORKMANSHIP WARRANTY  
BOND

A three (3) year bond shall be posted by the DEVELOPER and executed by a company authorized to do business in the State of Florida that is satisfactory to the CITY, payable to the City of Sanford in the amount of twenty (20) percent of the actual construction cost of all required potable water, reclaimed water, and wastewater improvements to be owned and maintained by the CITY with the exception of wastewater pump stations.

An itemized cost breakdown of the construction costs for all water and wastewater improvements, separated into offsite and onsite sections as applicable, shall be submitted along with the bond. Such bond shall guarantee maintenance of all improvements intended to be owned and maintained by the CITY for the required multi-year period. Said guarantee shall apply to the materials, workmanship, and structural integrity of all potable water, reclaimed water, and wastewater systems and miscellaneous related facilities, including mechanical equipment, for the required multi-year period commencing after a Certificate of Completion has been issued by the CITY. See Appendix B for required forms.

As an alternative to the provision of a surety bond from a Florida licensed company, the DEVELOPER may provide a certified cashier's check or an irrevocable letter of credit acceptable to the CITY through a State of Florida recognized

financial institution.

## 11.5 RECORD DRAWINGS

The DEVELOPER's ENGINEER shall submit two (2) sets of signed and sealed prints of the Record Drawings not less than 72 hours prior to the Final Inspection by the CITY. Final Record Drawings shall be submitted to the CITY, revised as necessary, after the Final Inspection, prior to the issuance of the Certificate of Completion for the improvements. The DEVELOPER's ENGINEER shall be responsible for recording information on the approved PLANS as construction progresses. Record Drawings submitted to the CITY as part of the project acceptance shall comply with the following requirements:

8. Record Drawings, signed and sealed by the Engineer of Record, shall be submitted to the CITY in a digital format and on a data storage device acceptable to the CITY. Two (2) sets of black lined prints of the Record Drawings shall also be provided to the City.

## **SECTION 20** **GRAVITY SEWERS**

### 20.2.3 DESIGN REPORT AND CALCULATIONS

DEVELOPER's ENGINEER shall submit a signed, sealed, and dated design report with the PLANS for all wastewater gravity system projects. Included calculations shall show that sewers will have sufficient hydraulic capacity to transport all design flows. Calculations shall utilize a Spreadsheet Format with the following column headings:

PLAN SHEET NUMBER  
FLOW DIRECTION  
**UPSTREAM MANHOLE ID**  
SURFACE ELEVATION (FT)  
INVERT PIPE ELEVATION - MINIMUM (FT)  
INVERT PIPE ELEVATION (FT)  
MANHOLE BOTTOM ELVATION (FT)  
MANHOLE HEIGHT (FT)  
**DOWNSTREAM MANHOLE ID**  
SURFACE ELEVATION (FT)  
INVERT PIPE ELEVATION - MINIMUM (FT)

INVERT PIPE ELEVATION (FT)  
 MANHOLE BOTTOM ELVATION (FT)  
 MANHOLE HEIGHT (FT)  
**PIPE LENGTH (FT) BETWEEN MANHOLES**  
 NUMBER OF ERC'S (ERC = 270 GPD)  
 ESTIMATED FLOW (GPM)  
 ESTIMATED FLOW WITH FLOW PEAKING FACTOR (GPM)  
 ESTIMATED FLOW - CUMULATIVE (GPM)  
**PIPE SIZE (INCHES)**  
 AREA - FULL FLOW (SQ FT)  
 SLOPE OF PIPE (% - FT PER 100 FT)  
 MANNING'S COEFFICIENT (n)  
 VELOCITY - FULL FLOW (FPS)  
 CAPACITY - FULL FLOW (GPM)

20.3.3 SLOPE

All sewers shall be designed and constructed to give minimum velocities, when flowing full, of not less than 2.0 feet per second, based on Manning's formula using a minimum "n" value of 0.013 for all pipe materials. The following minimum slopes shall be provided:

<u>Sewer Size</u>	<u>Minimum Slope in Feet Per 100 Feet</u>
8 inch	0.40
10 inch	0.28
12 inch	0.22
15 inch	0.15
18 inch	0.12
21 inch	0.10
24 inch	0.08
27 inch	0.07
30 inch	0.06
36 inch	0.04

Under special conditions, if detailed justifiable reasons are given (i.e., to resolve a conflict with structures, pipes, etc.), slopes slightly less than those required for the 2.0 feet per second velocity when flowing full may be permitted. Such decreased slopes will only be considered where the depth of flow will be 0.3 of the diameter or greater for design average flow. Whenever such decreased slopes are selected, the DEVELOPER'S ENGINEER must furnish his computations of the depths of flow in such pipes

at minimum, average, and peak rates of flow.

Where design velocities greater than ten (10) feet per second are attained, due to topography or other reasons, special provisions shall be provided for sewer protection.

Sewers shall be laid with uniform slope between manholes.

#### 20.4.2 DROP MANHOLE

An inside drop connection, with a pipe size that matches the incoming pipe size, shall be provided for a sewer entering a manhole where its invert elevation is 24 inches or more above the manhole invert. All manholes with an inside-drop connections shall have a minimum interior diameter of five (5) feet. Outside drop connections shall be prohibited. Where the difference in elevation between the incoming sewer invert and the manhole invert is less than 24 inches, the manhole invert shall be filleted or benched to prevent solids deposition.

### **20.6 GREASE INTERCEPTORS**

#### 20.6.1 GENERAL

All food preparation and service establishments shall have exterior in-ground grease interceptors with traffic rated tops, two access manholes, and sized in accordance with the Florida Building Code and comply with the STANDARD DRAWINGS. All wastewater flows from the food preparation areas of these establishments shall flow through CITY approved grease interceptors prior to entering the CITY wastewater system. Grease Interceptor tank capacities shall be a minimum of 750 gallons and a maximum of 1250 gallons.

### **20.7 OIL AND WATER SEPARATORS**

All car washes and other similar establishments shall have exterior in-ground oil and water separators with traffic rated tops, two access manholes, and sized in accordance with the Florida Department of Environmental Protection regulations, Florida Building Code, and comply with the STANDARD DRAWINGS.

## **20.8 GREASE SAMPLING STATIONS**

As designated by the CITY, all food preparation and service establishments shall have exterior in-ground grease sampling stations traffic rated tops, access manholes, and sized in accordance with the Florida Department of Environmental Protection regulations, Florida Building Code, and comply with the STANDARD DRAWINGS.

## **20.9 MATERIALS, INSTALLATION, AND TESTING**

Applicable provisions of Divisions III, IV, and V shall apply.

## **20.10 LOCATION AND IDENTIFICATION**

All lettering shall be legible and colors correct for the intended use. See the STANDARD DRAWINGS.

# **SECTION 21**

## **FORCE MAINS**

### **21.2.3 DESIGN CALCULATIONS**

DEVELOPER's ENGINEER shall submit a signed, sealed, and dated design report with the PLANS for all wastewater force main system projects. Included calculations shall show that the force main will have sufficient hydraulic capacity to transport all design flows. In order to obtain accurate and reliable flow and pressure design measurements if connecting to an existing wastewater force main, the DEVELOPER's ENGINEER shall retain a private pressure main tapping provider and coordinate with the Utilities Inspection Staff to install a 24/7 Data Logger at the proposed point of connection for the proposed development. Calculations shall be based on the information generated by the data logger. Atmospheric discharge of the proposed force main

into a gravity wastewater manhole shall not require this kind of data collection.

### **21.3 DESIGN AND CONSTRUCTION**

#### **21.3.1 VELOCITY AND DIAMETER**

At design pumping rates, a cleansing velocity of at least 2 feet per second should be maintained. Maximum velocity at design pumping rates should not exceed 8 feet per second for ductile iron pipe or 5 feet per second for PVC and HDPE pipe. The minimum force main diameter shall be six (6) inches for all such mains to be dedicated to the CITY or installed in rights of ways.

#### **21.3.2 DESIGN FRICTION LOSSES**

Friction losses through force mains shall be based on the Hazen and Williams formula. In the use of Hazen and Williams formula, the value for "C" shall be 120 for ductile iron pipe and 130 for PVC and HDPE pipe. "C" values greater than 130 shall not be allowed.

## **SECTION 22** **PUMP STATIONS**

### **22.1 GENERAL**

The design standards outlined in this Section shall apply to all public or private wastewater pump stations discharging 3000 gallons per minute or less.

Private pump stations shall be designed in accordance with this MANUAL including Figure 300 of the STANDARD DRAWINGS and Section 22.5, the pump manufacturer's criteria, and the regulations of the Florida Department of Environmental Regulations.

#### **22.2.3 PUMP AND MOTOR SELECTION**

The pump station shall be capable of pumping the peak design flow with the largest pumping unit out of service. Pumps shall be capable of meeting all system hydraulic conditions without overloading the motors. In addition, a minimum

FIVE (5) HP motor shall be required for pump stations to be dedicated to the CITY. Head capacity curves shall be prepared and submitted to the CITY along with the pump station plans. Such curves shall be based upon the friction losses outlined in Section 21.3.2 of these specifications. Head capacity curves shall verify that the pumps are operating at peak efficiency and are suitable for the design flow application. Pump and motor selection and head capacity curves shall reflect hydraulic conditions in cases where receiving force main systems are interconnected to additional pumping stations.

#### 22.2.4 DESIGN CALCULATIONS

DEVELOPER'S ENGINEER shall submit signed, sealed, and dated design report with the PLANS for all wastewater pump stations. Calculations shall include head capacity curves with copies of the manufacturer's pump curves, hydraulic analysis of force main system, operating cycle calculations with wet well sizing, buoyancy calculations, and electrical calculations.

In order to obtain accurate and reliable flow and pressure design measurements if connecting to an existing wastewater force main, the DEVELOPER'S ENGINEER shall retain a private pressure main tapping provider and coordinate with the Utilities Inspection Staff to install a 24/7 Data Logger at the proposed point of connection for the proposed development. Calculations shall be based on the information generated by the data logger in order to provide for an operating pressure that shall allow a minimum operational rate for any public lift station of ninety-five percent (95%) during a 24-hour period. Private lift stations shall be designed in order to provide for an operating pressure of not more than twenty (20) p.s.i., as controlled by the required Pressure Switch Assembly, that will provide for a minimum operational rate of ninety-five percent (95%) during a 24-hour period. Atmospheric discharge of the proposed force main into a gravity wastewater manhole shall not require this kind of data collection.

#### 22.3.9 SITE SIZING AND EASEMENT REQUIREMENTS

City and Private Pump Station sites shall be sized as delineated on Figure 300 entitled "Pump Station Site Plan" in the STANDARD DRAWINGS.

Separation distances between improvements with the pump station site that may require increasing the dimensions of the site shall be accommodated as follows: five (5) feet between the Control Panel and the Wet Well Opening, three (3) feet between the Control Panel and Generator Set, and three (3) feet between any part of the Control Panel and the Perimeter Security Fence. The Generator Set shall not be closer than three (3) feet to the Perimeter Security Fence.

Pump Station sites shall not be surrounded by or in stormwater management facilities, wetlands, etc.

With regard to CITY Pump Stations, the DEVELOPER shall dedicate the pump station site by warranty deed or plat to the CITY. Private Pump Station sites shall be designated on the PLANS as reserved for wastewater pump stations.

Dedicated easements may also be required around the site. In general, the property for the paved access drive shall also be dedicated to the CITY by warranty deed or plat. An exception to this requirement may be allowed, on a case-by-case basis by the DIRECTOR, in the form of an ingress/egress easement for the access drive.

#### **22.4 EMERGENCY OPERATION**

All pump stations shall be provided with emergency power receptacles as specified in Section 48.9. In addition, a permanent stand-by emergency generator set, including an automatic transfer switch, shall be provided for each Private Pump Station that will serve residential units and for those pump stations to be dedicated to the CITY. Said dedications shall be at no cost to the CITY. All such generators shall be rated and designed to operate the pump station under design conditions. Determination of the pump station's critical points shall be at the discretion of the DIRECTOR.

### **SECTION 23** **WATER MAINS**

23.2.3 DESIGN CALCULATIONS

DEVELOPER's ENGINEER shall submit a signed, sealed and dated design report with the PLANS for all water distribution projects. Calculations shall show that the water mains will have sufficient hydraulic capacity to transport peak hourly flows and the combination of maximum daily flows and fire flows to the farthest and/or highest point of the proposed development, while meeting the requirements of Section 23.3.1. Head losses through meters and backflow devices shall also be included in calculations.

In order to obtain accurate and reliable flow and pressure design measurements when connecting to an existing potable water main, the DEVELOPER's ENGINEER shall retain a private pressure main tapping provider and coordinate with the Utilities Inspection Staff to install a 24/7 Data Logger at the proposed point of connection for the proposed development or on the nearest fire hydrant assembly on the potable water main that will serve the proposed development. Calculations shall be based on the information generated by the data logger.

23.3.3 FIRE HYDRANT LOCATION AND SPACING

The maximum actual travel distance between hydrants in single family and duplex residential areas shall be eight hundred (800) feet and the maximum actual travel distance between the principal building and a hydrant shall be four hundred (400) feet. The maximum actual travel distance between hydrants in nonresidential and multiple family residential areas shall be five hundred (500) feet and the maximum actual travel distance between the principal building and a hydrant shall be two hundred and fifty (250) feet. Clear zones around hydrants shall be in accordance with the STANDARD DETAILS. Hydrants to be maintained by the CITY shall be lime-yellow in color and red for those that are to remain under private ownership.

**SECTION 25**  
**RECLAIMED WATER SYSTEM**

**25.1 GENERAL**

In accordance with the most recent edition of the CITY's Reclaimed Water and Cross Connection Control Policy, plus Florida Administrative Code 62-610 Part III, and Schedule "P" of the CITY's Land Development Code, the DEVELOPER shall utilize the CITY's reclaimed water system to accomplish irrigation needs and other uses that do not require potable water. Reclaimed water facilities shall be independent of all potable water, raw water supply, wastewater, and stormwater systems. Materials used in the installation and construction of reclaimed water systems shall be the same as that used for potable water facilities, with the exception of the color coding, and as specifically described in the STANDARD DRAWINGS.

## **SECTION 36**

### **HORIZONTAL DIRECTIONAL DRILLING**

#### **36.1 GENERAL**

- A. Horizontal directional drilling is a method of installation commonly referred to as directional drilling or guided horizontal boring.

#### **36.2 UTILIZATION**

- A. Directional drilling shall be allowed for pressurized mains only. HDPE, PVC, or DI pipe may be used.

#### **36.3 DESIGN**

- A. Horizontal alignment shall be as shown on the PLANS. The pipe shall have a minimum 36 inches of cover.
- B. The maximum depth shall be as shallow as physically possible while complying with all regulatory and manufacturers requirements. In no case, shall the minimum clearance from existing or, under special circumstances, proposed utilities to be crossed be less than 18 inches.
- C. Pipe diameter sizes for horizontal directional drill installations shall be in accordance with this MANUAL.
- D. All proposed HDPE pipe installations shall be increased by one pipe size above all proposed or existing adjacent PVC and Ductile Iron Pipe installations.
- E. For sub-aqueous crossings, a minimum cover of five feet shall be maintained over the pipe.
- F. The use of separate couplings to join sections of HDPE pipe shall be restricted to non-paved areas and depths of less than 6 feet below finish grade.
- G. Compound curvatures may be used, but shall not exceed the maximum deflections, as set forth by the pipe manufacturer or AWWA Standards, whichever is more stringent.

- H. Entry angle shall not exceed 15 degrees. Exit angle shall not exceed 12 degrees to facilitate pullback.
- I. A geotechnical subsurface report certified by an ENGINEER shall be provided to COSU that extends not less than five feet deeper than the proposed horizontal directional drilling activity's lowest invert elevation.
- J. When HDPE pipe connects to either push-on joint DI or PVC pipes, the DI or PVC pipes shall be restrained on either side of the point of connection with the HDPE section of pipe as specified in the applicable Restrained Pipe Table in the STANDARD DRAWINGS.

**SECTION 44**  
**TESTING AND INSPECTION**

**44.3 VIDEO INSPECTION**

In addition to the above tests, an internal video inspection for all gravity sewers shall be performed by the CONTRACTOR. Video inspection shall be used to check for cracked, broken, or otherwise defective pipe and installation. The CONTRACTOR shall provide the CITY with a copy of the video inspection for staff review in a format acceptable to the CITY. The CITY shall respond back to the CONTRACTOR within five (5) working days after the receipt of acceptable recordings.

**SECTION 45**  
**FORCE MAINS**

**45.8 PLUG VALVES**

**45.8.1 GENERAL**

In general, plug valves shall not be used in wastewater force mains other than within wastewater pump stations and treatment facilities. All plug valves shall be installed so that the direction of flow through the valve is in accordance with the manufacturer's recommendations. See Appendix C.

Resilient Wedge Gate Valves shall be utilized within wastewater force main systems.

**PART III**  
**STANDARD DRAWINGS**

Figure 117 (Typical Horizontal Directional Drill Installation) - (NEW)

Figure 201 (Manhole Connection Details) - (REVISION) Add Inside Drop Manhole Connection.

Figure 208 (Grease Interceptor) - (REVISION) Add up-to-date notes.

Figure 209 (Oil and Water Separator) - (REVISION) Add up-to-date notes.

Figure 210 (Gravity Sewer Future Connection) - (NEW)