

B. Potable Water Distribution

1. General

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All new potable water distribution systems constructed within the City of Milton shall be designed and constructed in strict accordance with FAC Chapter 62-555. No construction activity shall commence until all appropriate permits have been received from the Florida Department of Environmental Protection.

2. Design Flow

In sizing the distribution system water mains, the required design flow shall be the sum of the required fire flow plus two-thirds for the required domestic, industrial, commercial and institutional flow as described below.

a. Required Domestic Flow Residential

Required flow for domestic use in residential areas shall be based on not less than average daily flow rate of 100 gallons per capita per day. The average daily per capita water flow shall be adjusted by a “peaking factor” of four.

b. Required Industrial/Commercial/Institutional Flow

The designer shall include appropriate site specific allowances for large quantity water users such as industries, Laundromats, food processing operations, schools, etc. These design allowances shall be subject to review and approval by the City Manager or his/her designee.

c. Fire Flow

Required fire flow in single-family areas shall be a minimum of 500 gpm at 20 psi residual pressure. Higher fire flow requirements may be established by the Fire Chief in certain single family dwelling areas based upon the building areas of structures, fire loading, degree of physical separation between buildings, and other factors which contribute to rapid fire spread or excessive fire involvement. Required fire flow for industrial, commercial and institutional areas shall be determined in

accordance with the National Fire Protection Association methodologies.

3. Distribution System Connections to Subdivisions

A subdivision to be supplied by the City water system and having a design flow requirement as determined herein of not more than 1500 gpm may have a single connection to the distribution system, provided that design flow requirements can be met with such connection. Should any proposed subdivision have a design flow of over 1500 gpm, that subdivision shall require a minimum of two connections to the distribution system.

4. Distribution Main Layout and Sizing Criteria

Distribution mains shall be of sufficient size to furnish the required flow at pressures and velocities as herein provided. All mains shall be installed only in dedicated streets, alleys, public right-of-ways or utility easements. All main locations and sizes shall be in accordance with the City of Milton's current "Water Master Plan". If the installation of a "dead-end" main cannot be avoided, its dead-end length shall not exceed 1,000 feet unless specifically authorized by the City. When a fire hydrant is installed on a dead-end main exceeding 300 feet, the fire hydrant shall be supplied by a main of not less than eight inches in diameter. When a fire hydrant is installed on a dead-end main exceeding 600 feet, the fire hydrant shall be supplied by a main of not less than ten inches in diameter. All dead-end mains less than six inches shall be looped. Dead-end mains of six inches or larger shall be provided with a fire hydrant at the end of the main. See Figure II-18 for general details.

a. Required Pressure

Water pressure in the distribution system shall be not less than 30 pounds per square inch with no fire hydrants in use. When fire hydrants are in use, water pressure on the main at sidewalk level shall not be less than 20 pounds per square inch. When water pressure normally exceeds 100 pounds per square inch, there shall be installed on the property side of the water meter an approved type pressure regulator in conformance with the Plumbing Code.

b. Minimum Main Size

Minimum distribution main diameter shall be three (3) and six (6) inches single-family residential areas and eight inches in all other areas. No more than six (6) homes shall be on a three (3) inch main. A standard ¾" water service shall be installed for each connection to be made. No "WYE" type connections will be allowed unless approved by City.

c. Standard Size

Standard sizes of mains used shall have nominal diameters of three (3) inches, six (6) inches, eight (8) inches, ten (10) inches, twelve (12) inches, eighteen (18) inches, and twenty-four (24) inches.

d. Velocity

Velocities of water for the non-fire flow conditions in the distribution mains shall not exceed six feet per second.

e. Cover

- (1) A minimum cover of 30 inches must be provided where conditions permit.
- (2) At road crossings, a minimum separation distance of 24 inches shall be maintained from the bottom of the base to the top of the casing when provided.
- (3) At stream crossings, ball-joint ductile iron pipe or other acceptable means shall be used.

f. Crossings

Major road crossings shall be encased in a steel casing. Additional requirements of the regulatory agency responsible for the road shall be met.

5. Potable Water Pipework

a. Materials

All material shall be free from defects impairing strength and durability and be of the best commercial quality for

the purpose specified. It shall have structural properties sufficient to safely sustain or withstand strains and stresses to which it is normally subjected and be true to detail.

**b. Unplasticized Polyvinyl Chloride (PVC)
Pressure Pipe**

PVC pressure pipe shall have a bell-type joint designed for conveying potable water under pressure. Ring-type neoprene gasket shall be provided in recesses in the bells to make the joints watertight for all slip joint piping. Only where specifically called for on the construction plans shall solvent-weld or flanged connections be used. All fittings shall be of the same joint design as recommended by manufacturer. PVC pipe shall be AWWA-C900 SDR 25.

All fittings for PVC pressure pipe shall be ductile iron mechanical joint meeting the requirements of ANSI/AWWA C153/A21.53.84 ductile iron compact fittings three inch through 12 inch for water and other liquids. *All fittings to be meg-a-lug.*

The working pressure rating for fittings shall be 350 psi. Fittings shall be furnished with an asphaltic outside coating in accordance with ANSI/AWWA C153/A21.53 and cement lined and seal coated with an asphaltic material in accordance with ANSI/AWWA C104/A21.4.

Pipe must be certified as suitable for potable water use by the National Sanitation Foundation (N.S.F.) and marked as follows: NSF-PW.

Each length of pipe shall be clearly marked with the following information at intervals of five feet or less:

- (1) Nominal pipe size and OD base
- (2) Material code designation
- (3) Dimension ratio number
- (4) AWWA pressure class and standard designation number
- (5) Manufacturer's name or trademark
- (6) NSF approval seal

c. Ductile Iron Pipe

Ductile iron pipe shall meet the requirements of ANSI A21.51, including Addenda A21.51a. Pipe dimensions shall conform to Federal Specification WW-P-421, Class 150. Each pipe shall be conspicuously marked on the outside of the barrel to readily identify it from Cast-Iron. Metal thickness shall conform to ANSI A21.51, Table 51.1, 2-1/2 to 5 feet cover.

(1) Mechanical Joints

ANSI Standard Specification A21.11, Rubber Gasket Joints for Cast-Iron Pressure Pipe and Fittings.

(2) Push-on Joints

ANSI Standard Specification A21.11, Rubber Gasket for Cast-Iron Pressure Pipe and Fittings, Single gasket push-on type. *All push-on joints to be restraint one full joint from fitting.*

(3) Flanged Joints

ANSI Standard Specifications B16.1, Cast-Iron Pipe Flanges and Flanged Fittings, 125 pounds. The flanged joints shall be assembled by threading plain end pipe and screwing on long hub flanges. The connection shall then be power tightened and refaced across both face of flange and end of pipe. Provide 1/16-inch ring gaskets of red sheet rubber meeting the requirements of Grade I, Table I of ASTM Specification D1330-66, Sheet Rubber Gaskets. Connections shall be made with machine bolts and hexagonal nuts.

d. Linings & Coatings for Ductile Iron Water Mains

All pipe, valves, fittings and specials for water shall be thin cement lined, the lining shall comply with ANSI standard A21.4 (AWWA C104) "Cement-Mortar Lining for Cast-Iron Pipe and Fittings for Water". The exterior of buried pipe shall receive a coat of hot-dip coal tar as specified in ANSI A21.6. The exterior of all above ground pipe shall receive a coat of rust inhibitor prime compatible with the finish paint schedule. All bolts, nuts, studs and other uncoated parts of joints for underground

installation should be coated with asphalt or coal tar prior to backfilling.

e. Metallic Tracer Wire

Tracer wire shall be placed in the trench and shall be approximately 12" above the pipe to be installed. The wire shall be 12 gauge insulated THW and shall be terminated so that a locating device can be easily attached. All splices below grade shall be insulated.

6. Valves, Hydrants, Meters & Miscellaneous Appurtenances

a. Materials

All material shall be free from defects impairing strength and durability and be of the best commercial quality for the purpose specified. It shall have structural properties sufficient to safely sustain or withstand strains and stresses to which it is normally subjected and be true to detail.

b. Valves

(1) Gate Valves

Provide gate valves meeting the following requirements:

(a) Gate Valves Two Inches and Larger

Gate valves shall be of the resilient seated wedge type, epoxy coated to AWWA C550 cast-iron body design. They shall comply with the American Water Works Association Gate Valve Standard C509 as latest revised. Valves shall be rated for zero leakage at 200 psi water working pressure and have a 400 psi hydrostatic test for structural soundness. All testing shall be conducted in accordance with AWWA C-509. Gate valves shall be furnished with type of end connection specified as follows: mechanical joint per AWWA C-111.

All cast-iron shall conform to ASTM-A-126 Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Stems shall be manganese bronze having a minimum tensile strength of 60,000 psi, a minimum yield of 20,000 psi. Bolts shall be electro-zinc plated steel with hex heads and hex nuts in accordance with ASTM A-307.

(b) Gate Valves Under Two Inches

Gate valves under two inches shall be bronze body, threaded ends, non-rising stem, solid wedge disc and shall be American Model 3FG or approved equivalent.

(2) Check Valves

Provide check valves meeting the following requirements:

(a) Over Three Inches

The check valves over three inches shall be iron-body, bronze-mounted, horizontal swing check with flanged ends. All working parts shall be spring-loaded to prevent slamming. The check valves shall be M & H Fig. 250F, American Darling 50 Line or approved equivalent.

(b) Under Three Inches

Check valves under three-inches shall be screwed-end, bronze body, silent check valves as manufactured by Crane Co., No. 34 or approved equivalent.

(3) Air Release and Vacuum Valve

The combination air release and vacuum valve shall be furnished with both a large and small orifice. The valve shall automatically function to release to atmosphere both large and small amounts of air that accumulate in this pipeline. Once the air has been exhausted, both the large and small valves shall seat tightly to prevent water

leakage. The valve shall also function to admit air into a line, tank, or chamber under emergency conditions of when it is being drained. The valve body and cover shall be of semi-steel; floats of stainless; levers of bronze and resilient seats. The air and vacuum valve shall be manufactured by G-A Industries, Inc., Type I-AV or approved equivalent *and put in a valve pit.*

c. Hydrants

(1) Fire Hydrants – Separation

Maximum separation between fire hydrants shall be 1,000 feet. In no case shall the farthest point or corner of any new structures be permitted to be located more than 500 feet from the nearest fire hydrant capable of delivering the required fire flow. The hydrant distance is to be measured as the hose is laid.

(2) Fire Hydrants - Type

All fire hydrants shall be 5-1/4" inch hydrants with two 2-1/2" inch connections and one pumper connection designed for 150 psi working pressure, and shall conform to the requirements of AWWA C502. Hydrants shall have mechanical joint inlets, shall be for a three-foot bury, and shall be breakaway or traffic model, dry barrel type.

The hydrants shall be Mueller Co., Centurion A-423, M & H Style No. 129, or approved equivalent. See Figure II-17.

(3) Fire Hydrants - Installation

All fire hydrants shall have a 6" valve set two (2') foot in front of the fire hydrant line. They shall have one (1') foot of pea gravel under hydrant and one (1') foot around and over incoming pipe. The hydrant line shall be fully restrained from the water main line. See Figure II-17.

d. Water Services

(1) Meter Boxes

Meter boxes shall be provided and installed by the contractor unless other arrangements have been made with the City of Milton.

(2) Meters

Residential meters shall be provided and installed by the City of Milton. All commercial meters 2" or larger shall be provided and installed by the contractor. All meters installed shall be TouchRead PitLid 1000 Gallon meters purchased from the following vendors:

- a) Invensys Metering Co.
 - b) Hughes Supply
 - c) National Water Works
- Meter Description (Commercial)

5081295071925
Meter 2" SR TRPL 1000 Gallon
Screwed, Rocksyn Chamber
W/20' Sensor & Housing

5191290071921
Meter 2" W160S Turbo TRPL
1000 Gallon
W/Integral Strainer
W/20' Sensor & Housing

5731290071902
Meter 2" SRH Compound TRPL
1000 Gallon, Rocksyn Chamber
W/20' Sensor & Housing

With meters of two (2) inches and larger the contractor shall contact City staff to confirm the size and type meter to be installed.

(3) Service Clamps

Service clamps shall be Ford Model FS202 or approved equivalent.

(4) Corporation Stops

Corporation stops shall be Ford Model No. F-1000 or approved equivalent. Inlets shall have iron pipe

threads and outlets shall have compression connections.

(5) Curb Stops

Curb stops shall be Ford Model No. BH 41-233 or approved equivalent. Inlets shall have compression connections and outlet shall have iron pipe threads. Valves shall be equipped with padlock eyes or approved equivalent.

(6) Service Tubing

Service tubing shall be listed as having the approval of the National Sanitation Foundation for Water Distribution; and shall have the NSF approval designation stamped on the tubing. Service tubing shall be polybutylene meeting AWWA C-902, SDR 11. It shall be delivered in rolls and cut to required lengths. All service tubing shall be encased under paved surfaces using PVC, or other approved materials.

(7) Wye Branches

Pre-approved wye branches for double services are to be pack joint wye branches, Ford Model No. Y44-243 or approved equivalent.

e. Valve Boxes

Cast iron valve boxes shall be provided for all underground valve installations. They shall consist of a base covering the operating nut and head of the valve, a vertical shaft, at least five and one quarter inches in diameter, and a top section extending to a point even with the finished ground surface. Provide a cast iron cover marked "WATER" or "SEWER" as required and placed concentrically over the operating nut. The valve boxes shall be Clow F2452 screw type valve box, or an approved equivalent.

f. Steel Casing

All casing used for boring and bridge crossing shall be wrought steel Schedule 40 with a minimum yield strength of 35,000 psi. Bore casing shall have an exterior protective coating of Coal-Tar Enamel in accordance with AWWA C204. The casing shall be installed by either jacking or boring at the option of the

Contractor. Ends shall be free from splits or other rough edges, which might damage the carrier pipe. Bridge crossing casing exterior shall be painted with two coats of rust inhibiting paint.

g. Backflow Preventer

Backflow preventers are required on all water connections. The Cross-Connection Control Program (CCCP) defines them as either low or high hazard. A non-testable dual check valve assembly shall be placed on all residential connections that are $\frac{3}{4}$ and 1 inch by the city at the time of connection. All connections larger than one inch require a non-testable dual check valve assembly to be installed by the customer. Some residential connections may require a higher degree of protection and this will be determined by the CCCP coordinator.

Non-testable dual check valve assemblies consist of two separate check valves that are not testable.

All connections defined as high hazard shall include an approved double check valve assembly or a reduced pressure principal backflow preventor assembly.

1. A double check valve assembly shall be a complete assembly. The assembly shall include two positive seating check valves, two tight closing shut-off valves (located upstream and downstream of the check valves) and four suitably placed test cocks. The assembly shall be located such that it is assessable for testing.
2. A reduced pressure principle backflow preventor assembly shall be a complete assembly. The assembly shall include two independently operating check valves designed for installation in a normal horizontal flow attitude. An independent relief valve shall be located between the two check valves. Two tight closing shut-off valves (located upstream and downstream of the check valves) and

four suitably placed test cocks shall be installed along with a strainer to protect the entire assembly. The assembly shall be located such that it is assessable for testing.

All backflow preventors shall be in full conformance with the American Society of Sanitary Engineering Standards, the ASSE Standard 1015 and meeting all the requirements of the U.S.C. Foundation for Cross Connection Control.