

EWD SPECIFICATIONS FOR CONSTRUCTION OF
WATER DISTRIBUTION SYSTEMS

1.0 DISTRIBUTION SYSTEMS - GENERAL

Distribution systems shall be designed in accordance with these regulations and applicable requirements of Chapter 17.555 Florida Administrative Code, as amended.

1.1 Design Period

Except for parts of the system that can be readily increased in capacity, distribution systems shall be designed for the estimated ultimate tributary population 20 years hence.

1.2 Design Factors

In determining the required capacities of the distribution system, the following factors shall be considered:

- A. Maximum hourly demand
- B. Additional demands for fire fighting

1.3 Design Basis

New distribution systems shall be designed on the basis of an average daily per capita water demand of not less than 100 gpd when no water use information is available. In addition, non-domestic demands must be quantified and added to the domestic demand.

As an alternate method, when the need for deviations from the foregoing per capita rates is demonstrated, a brief description of the rationale and methodology used shall be submitted to EWD for consideration and approval.

1.4 Design Standards

All distribution system elements shall, unless specifically modified herein, be in compliance with the following manuals and standards:
1) Recommended Standards for Water Works, Great Lakes-Upper Mississippi River Board of State Sanitary Engineers, as published by Health Education Service, P. O. Box 7283, Albany, New York 12224 (latest edition), 2) American Water Works Association 1) Latest edition of Standard AWWA C-600 Installation of Ductile Iron Mains and their Appurtenances. To be used for ductile iron and C-900 plastic pipe. Pipe bedding to be Type 5 as shown on Figure 1 - AWWA C-600.

2.0 DETAILS OF DESIGN AND CONSTRUCTION OF WATER MAINS

2.1 Size

Any distribution system shall not be less than four (4) inches in diameter. Any pipe 12 inches or larger must be Ductile Iron.

2.2 Depth

Water mains shall have a minimum of 2.5 feet (30 inches) and not more than 3.0 feet (36 inches) of cover under roadways and paved areas, and 2.5 feet (30 inches) to 3.0 feet (36 inches) of cover at final grade under open areas, if more than 3.0 feet (36 inches) is required ductile iron pipe must be utilized.

2.3 Pipe Bedding and Trench Backfill

All mains shall be designed to prevent damage from superimposed loads. Proper allowance for loads to the water mains shall be made due to the width and depth of trench.

A. Rigid & Flexible Pipe - Pipes shall be bedded in accordance with AWWA C-600 Pipe bedding to be Type 5, as shown on AWWA C-600 Figure 1.

B. Trench Backfill

1. Backfill material- trench backfill material shall consist of any of the following: well graded coarse granular materials with maximum particle size not exceeding 4 inches; sands, gritty sands; or clayey sands. Solids having more than 35% of its weight passing a No. 222 sieve shall not be used as backfill.

2. Backfill area shall be compacted to not less than 95% of maximum density as determined by AASHTO T-99.

3. Density test as required by the District.

2.4 Pressure Test and Allowable Leakage

Pressure test shall be made in accordance with AWWA C-600 modified as follows:

Apply 150 psi pressure and maintain constant for two (2) hours. After two (2) hours measure amount of water required to maintain test pressure.

Leakage shall be measured by the quantity of water pumped into the pipe to maintain test pressure during test period. Maximum permissible leakage shall be less than the number of gallons per hour determined by the following formula:

$$L = S \times D \times (P)^2 \text{ over } 133200$$

L = Allowable leakage in gph

S = Length of section tested in feet

D = Nominal diameter of the pipe in inches

P = Average pressure maintained during the leakage test in psi.

Contractor shall perform all excavations to hydrostatically pressure test the tapping sleeve and gate valve to 150 psi for a minimum of two (2) hours. EWD personnel must be present at all times during testing period. (48 working hours notice is required)

3.0 PROTECTION OF WATER SUPPLIES

There will be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto, which would permit the passage of any wastewater or polluted water into the potable supply.

Sewers shall be laid at least 10 feet laterally, from any existing or proposed water main. Should local conditions prevent a lateral separation of 10 feet, a sewer main may be laid closer than 10 feet to a water main, if it is installed in a separate trench and if the elevation of the top (crown) of the sewer is at least 18 inches below the bottom (invert) of the water main.

4.0 TAPPING EWD EXISTING MAINS

EWD personnel will perform the tapping of the water main at Contractor's expense. The Contractor is responsible for the required coordination with EWD staff for the inspection and tapping of water mains. (48 working hours notice is required)

5.0 LOCATES

It is the responsibility of the Contractor to locate existing water mains and other utilities.

6.0 PERMITS

It is the responsibility of the Contractor to obtain all the necessary permits from County and State agencies to perform the work.

7.0 UTILITY PROPERTIES AND SERVICE

The Contractor shall be solely and directly responsible for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from his construction operations.

8.0 SAFETY AND CONVENIENCE

The Contractor shall do all work necessary to protect the general public from hazards, including but not limited to, trenches or excavation in roadway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public.

9.0 MATERIAL SPECIFICATIONS

The following materials shall be utilized in the installation of water distribution systems.

- a. Pipe
 1. Ductile iron AWWA Class 350 meeting ANSI 21.51 specifications.
 2. PVC bell and spigot pipe meeting AWWA C-900, DR 18 Class 150 specifications. Color - Blue
- b. Fittings
Mechanical joint meeting AWWA C-110 and C-153, Class 350 specifications. 3" thru 24", Class 350 specifications.
- c. Gate Valves
2" threaded R.S. Clow F-6103 -4" through 10" Mueller A-2360-20 or Clow F-6100, mechanical joint, resilient seat meeting AWWA C-509. Class 200 specifications.
- d. Air Release Valves
2" APCO Model No. 200
- e. Valve Boxes
18" x 24" USF 7500 Russco 461-S or 461 A and 20" x 36" 562-S, two piece cast iron screw-type valve box. Extensions to be cast iron.
- f. Fire Hydrants (with nominal 5 1/4" main valve)
Mueller Centurion A-423, or Clow Medallion F-2545, meeting AWWA C-502 specifications. Equipped with two (2) 2 1/2" hose nozzles and one (1) 5 1/4" pumper nozzle. (See Detailed Drawing Attached)

- g. Service Connection
Polyethylene pressure pipe, copper tubing size, meeting AWWA C-901, 160 psi.
- h. Service Saddle
2" thru 6" Mueller H-134, 8" thru 23" Mueller H-161. Double strap:
2" thru 6" Ford S-91, 8" and up Ford 202-B. Brass to be used on all taps.
- i. Corporation Stop
2" Mueller B-20046, 3/4" or 1" Mueller H-15023, H-15028, or Ford F-1100 pack joint for CTS.
- j. Meter Box
Single Ford gulf box - G 148-233
Double Ford gulf box - DG 148-243
- k. Compression Union and Couplings
Mueller H-15403 or Ford C-44 series for CTS pipe.
- l. Butterfly Valves
12" and above - Kennedy BFV 80 or Mueller B3211
- m. Tapping Sleeves or D.I. Fittings
4" thru 12" Mueller H-615, 6" thru 12" 662-663 Clow Tyler or Rockwell (stainless steel). Main to be hydrostatically tested prior to tapping -- 150 psi for 2 hours.
- n. Tapping Valves
4" thru 12" Mueller H-687 and T-2360-16 or Clow F-5093 mechanical joint by flanged end. Resilient seat meeting AWWA C-509 Class 200 specifications.
- o. Ball Valves
2" Mueller B-20283 or Ford equal.
- p. Backflow Prevention
Backflow preventer must be installed above ground, at the water meter. All commercial and high hazard residential (swimming pool or irrigation system) must use reduced pressure. All other single family residence must have a double check valve. All fire lines must have a double detector check valve.

Partial list of approved backflow preventers

Reduced Pressure	Double Detector Check
Febco Model 8	Febco Model 806 DDC
or 825 Y	Watts Model 709 DDC
Watts Model 009QT	Hersey Model DDC 11
Hersey Model - II	

Double Check Valve
Febco Model 805, 805 Y, or 810
Watts Model 709
Hersey Model FDC #2 or

10.1 Upon completion of the project, the following items must be submitted to EWD prior to acceptance:

- a. Certificate of Completion from Engineer of Record to include date and results of water line pressure tests, and dates and results of bacteriological analysis (void after thirty (30) days) if not performed by EWD.

b. Two (2) completed signed and sealed paper copies and one (1) mylar copy of record drawings of the underground distribution lines detailing the following information:

- 1) Type of materials installed - mains, services. Also, indicate all locations of change of material.
- 2) Indicate depth of cover over water main at 100 feet intervals, as well as, at major breaks in direction.
- 3) As-built length of all jack and bore casings, and as-built distance from each casing to limit of mechanical joint pipe.
- 4) Tie in distances from at least two (2) permanent structures to each valve, fitting, service line, blow-off points, hydrants, each end of jack & bore casing, etc.
- 5) Certified survey of the line with the valves only to be located from three (3) fixed structures.
- 6) As-built measurements of the service line must be indicated along each segment of the installed pipe route, as well as as-built measurements from the centerline of the road to the main at least every 200 feet.
- 7) Bacteriological sample test points must be clearly indicated.