

SECTION III - WATER DISTRIBUTION SYSTEM

A. BASIS OF DESIGN - Approval for construction, extension, expansion or use of any community water supply shall be based on the criteria as outlined in Palm Beach County Environmental Control Rule II and the references included therein as well as the following requirements:

1. There shall be no physical connection between a potable water supply and a questionable water supply, or a sanitary or storm sewage system by direct pressure, vacuum, gravity or any other means. All potable water services serving properties with a sewage pump station or an auxiliary water supply shall be provided with an approved reduced pressure backflow prevention device. Permanent dead ends in water mains will not be approved unless it can be demonstrated that looping the system is not feasible. When dead ends are necessary, the Authority requires that a flush hydrant be installed on the terminal end
2. All water distribution systems shall be looped to the greatest extent possible. Water mains shall have a minimum nominal inside diameter of 6 inches. Water mains having an inside diameter of less than 6 inches will not normally be considered. Looping is required for mains serving 25 or more dwelling units or considered critical use.
3. All buildings over two stories in height shall be provided with a domestic water service booster pump which may be located within the building. Drawings of pump and building must be submitted along with the pump calculations.
4. Building fire sprinkler systems shall be equipped with booster pumps as may be required to comply with applicable fire protection codes.
5. Approved backflow prevention devices are required on all water service connections (domestic, commercial, fire, irrigation, etc.) in accordance with Authority specifications shown in standard details in this manual. New master metered non-residential accounts, new accounts servicing buildings with more than two stories, medical offices, restaurants, and all other accounts where continuity of water service is critical shall install dual backflow prevention devices or provide a second source of potable water. Backflow devices shall be installed on the outlet side of the water meter; no tees or other branch fittings are allowed between the water meter and backflow device.
6. Valving of all systems shall be designed to facilitate the isolation of each section of pipeline between intersections of the grid system. Generally, the number of valves at an intersection shall be one less than the number of pipes forming the intersection. All valves shall be right hand closed operation; valves 12 inches or greater shall be butterfly valves. Valves shall generally be installed at intervals of not more than 1,500 LF on transmission mains and on all primary branches connected to these lines. In high density areas, valves shall be installed as necessary to minimize the number of customers affected by a water main break (25 dwelling units).

7. Meter Location:

- a. Meters shall be set in green area generally at a common property line. Meters and control valves shall be accessible and unobstructed for 4 feet in all directions. This shall include but not be limited to transformers, telephone junction boxes, walls, trees, etc.
- b. Meters shall not be placed in areas that can be fenced, such as backyards. Meters shall not be placed in any asphalt or concrete surfaced areas (sidewalks, curbs, driveways, etc.) unless approved in writing by Authority.
- c. In commercial or zero lot line areas when no other alternative is available, meters will be allowed in asphalt provided all of the following conditions are met:
 - i. The top of box shall be flush with asphalt surface and located outside of any drainage flowline (i.e. dry surface area).
 - ii. The box shall not be located within parking stalls.
 - iii. The box and lid shall be traffic bearing and shall be placed away from common traffic area. Pipe stanchions may be required under certain conditions.
 - iv. The curb valve box must be installed on main line connection.

8. Service lines shall not exceed 75 feet from the main to the meter. Where possible, meter shall be placed in green areas as close to the water main as possible. Service lines covered by paving between the water main and meter will not be acceptable where avoidable.

9. Service lines shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall.

10. Water mains shall have blue stripes applied to the pipe wall at the time of manufacturing. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape is used to stripe pipe during installation of the pipe, the tape shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Tape shall be vinyl plastic back with a minimum width of 6 inches. Field application of paint shall not be acceptable.

B. HYDRAULIC DESIGN

Hydraulic designs shall be based on pressure data relative to the water pumping facilities which will service the proposed system. Water mains shall be sized such that

the maximum velocity of water in the main will not exceed 10 feet/second under fire flow conditions.

C. INSTALLATION OF WATER MAINS

1. Contractor shall comply with Palm Beach County Health Department Technical Memoranda regarding all water main connections to existing system or lines already bacteriologically cleared.
2. Installation and testing of water system pipe and fittings shall be in accordance with AWWA Specification C-600 Latest Revision and Authority's Construction Standards and Specifications.
3. Any pavement cut shall be replaced in accordance with requirements of the Authority's Pavement Replacement Detail Drawing and in accordance with all other applicable governing agency's permitting requirements.
4. Omni Marker #75025 or 3M 1403-1266 blue magnetic markers shall be placed above all fittings, changes in alignment, grade and water services and at the discretion of Authority's representative.
5. All loading or unloading of pipe, fittings, valves and accessories shall be done in such a manner so as to avoid damage. The pipe shall not be skidded or rolled against pipe already unloaded. Special precautions should be taken to avoid damage to cement lined fittings and pipe. The interior of all pipes, fittings and other appurtenances shall be kept free of dirt and foreign matter at all times.
6. All mains, valves, bends, tees, crosses, and dead ends shall be restrained with an approved SUA restraint joint system. On mains greater than 12", all valves, bends, tees, crosses and dead ends shall be restrained with 2 forms of an approved SUA thrust restraint system. Where proprietary restrained joint are not used, tie rods and megalugs are the recommended system. Where adequate space exists, SUA may approve the use of thrust blocks.
7. Tie rods used as a method of joint restraint shall be by means of steel tie back bolts, nuts, washers and all thread rods meeting ASTM A-242 requirements (CorTen steel or equal) and painted in accordance with the procedures described herein. Tie rods and nuts shall be equal in diameter to the tee bolts and nuts which were supplied with the applicable fittings. Two tie rods per joint are required for sizes 4" diameter through 10" diameter, four tie rods per joint for sizes 12" diameter through 16" and 6 tie rods per joint for sizes 18" through 24".
8. Air relief valves shall be installed at the design high points. Installation of air release valves to correct high points caused by improper installation of pipe (not at design grade) will not be permitted.
9. All pipes shall be laid to line in a clean dry trench on line and grade with valves and hydrant stems plumb. All pipes shall have a minimum cover of 30 inches and a maximum cover of 48 inches unless otherwise noted on the plans or required by permit.

10. The trench at the top of the pipe shall be kept to a maximum width of 24 inches plus the pipe diameter. The trench shall have a flat bottom, cut true and even, so that the barrel of the pipe shall bear its full length. Pipe bells will be placed in small pockets specifically excavated to receive the bell. All excavations must be in compliance with OSHA regulations.

11. No rocks larger than 2 inches in diameter or other items that may damage the pipe will be permitted over the pipe. In the event pipe is installed in rock excavation, 6 inches of granular material will be provided for bedding under the pipe. All pipe joints, thrust blocks, conflicts and service connections shall be left exposed until visually inspected and approved by an Authority representative.

12. Tapping Sleeves

- a. Tapping sleeves and tapping crosses shall be of the heavy body ductile iron, mechanical joint type or stainless steel wrap around type as approved.
- b. All tapping assemblies installed on existing water mains shall be pressure tested and witnessed by Authority's representative prior to the actual tap of the main. The pipe coupon shall be carefully preserved and submitted to Authority's representative. All tapping sleeves shall be installed a minimum of 6 feet from pipe joints.
- c. All field cuts and tapping operations on pipe shall require careful repair of the particular lining damaged in strict accordance with the manufacturer's recommendations. All materials utilized shall be NSF 61 approved.

13. Fire hydrants shall be dry barrel type without drain installed true and plumb. Hydrant extensions shall not be permitted in new construction.

14. A lightweight high density polyethylene pipe plug shall be required to be on all pipes delivered to the site. The plugs shall remain on both sides of the pipe until pipe is installed to ensure that the pipe will not be contaminated.

D. CLEANING AND FLUSHING

1. Upon completion of the pipe installation for any section, the mains shall be cannon flushed to remove dirt and any other foreign matter by achieving a minimum velocity of 5 feet per second on pipe sizes up to and including 12" and 2.5 feet per second on pipe greater than 12". The duration of the flushing shall be sufficient to provide a minimum flush volume equal to three times the internal volume of the pipeline being flushed. Temporary fittings, pipe, etc. may be used to facilitate cannon flushing.

- a. Prior to the actual line flushing operation, the contractor shall notify Authority's representative of such intended water use. No flushing shall take place without an Authority representative present.
- b. No flushing shall take place until after the 2 inch bypass line and meter is installed and the mains have been filled utilizing the 2 inch meter.

- c. Flushing will not be scheduled until the Authority has approved preliminary record drawings, unless it is required to facilitate construction of water mains.
 - d. The contractor shall exercise due care so as to ensure that the water used in flushing does not cause a nuisance or inflict property damage.
2. Pigging is required for all water mains 16" and greater in diameter. The Authority may require water mains less than 16" in diameter be pigged if the Authority or the EOR's representative observes mains being installed under substandard conditions.
 3. No existing valves shall be operated, except by Authority personnel.

E. TESTING

1. Unless otherwise approved, all hydrant connections, service connections to the curb stop at the meter, and all joints in the water mains shall remain uncovered for visual inspection by an Authority representative. The contractor shall only backfill after approval by Authority's representative.
2. The contractor shall provide all necessary equipment such as pumps, gauges and water measuring tanks and shall perform all work required for pipe pressure and leakage test. Pressure and leakage tests shall be made between valves and/or connections for each section tested using the procedure outlined in ANSI/AWWA C-600 Latest Revision and Authority requirements. Record drawings in accordance with Exhibit E "Required Information on Record Drawings" must be accepted by the Authority prior to scheduling a pressure test. A pretest shall be successfully completed by the contractor and observed by a representative of the EOR prior to scheduling the pressure test with Authority. All other tests shall be made in accordance with these specifications and observed by the EOR and Authority's representative.
3. 1,500 LF shall be the maximum length of main to be pressure and leakage tested at any one time. Testing of isolated portions between valves within the test section may be required by Authority if a portion of that line appears questionable.

- a. PRESSURE AND LEAKAGE TEST - A hydrostatic pressure of 150 psi shall be developed by the contractor, within the section of pipeline to be tested and this pressure (150 psi) shall be held for a minimum time period of one hour.

After successfully completing the pressure test, pressure in the pipeline being tested shall be reduced to 100 psi and that pressure shall be held for an additional one hour time period. All visible leaks, including damp spots shall be corrected regardless of the results of the pressure and leakage tests.

- b. ALLOWABLE LEAKAGE - Leakage during both the pressure and leakage test shall not exceed the following formula for gasketed pipe:

$$L = (SDP^{1/2} / 148,000) \times 0.5$$

L= Allowable Leakage (gallons per hour).

S = Length of Pipe to be Tested (feet)

D = Nominal Diameter of Pipe (inches)

P = Average Test Pressure (PSIG)

No allowable leakage for polyethylene pipe

- c. A loss of 5 psi or more during the 150 psi, regardless of the amount of leakage shall be considered a failing test. A loss of 5 psi or more during the 100 PSI, regardless of the amount of leakage shall be considered a failure. A total loss of 10 psi or more for both test combined shall be considered a failing test.
- d. A gain in pressure during the test shall be considered a failing test.
- e. The pressure test shall be considered not acceptable unless all valves servicing hydrants, services, etc. in test section are in the open position. The system must be completed to the full extent of the approved plans on that portion being tested. The contractor shall provide a 1/2" ball valve adjacent to the test pressure gauge for installation of Authority's "check gauge". The use of PVC pipe and fittings for temporary piping for pressure testing is not permitted. Test gauge shall be in 2 pound increments with a minimum 3 inch face.
- f. Failure of the test gauge to zero out upon completion of testing shall be cause for rejection.
- g. The contractor shall, at his own expense, adjust or replace, at the discretion of the EOR, any component of the pipeline which fails the prescribed tests. The pipeline shall then be tested as described above until is successfully conforms to said tests.
- h. All water utilized for the pressure and leakage test shall be potable water with an adequate chlorine residual.
- i. The Authority will not schedule the pressure test until pipe has been properly backfilled, compacted and established final grade and as-builts accepted.

F. DISINFECTION

1. Disinfection of mains shall be in compliance with Rules 62-555.340 Florida Administrative Code (F.A.C.) and applicable American Water Works Association (AWWA) disinfection standards (AWWA Standards C651, C652, C653, and C654), which are incorporated by reference in Rule 62-555.330(4), F.A.C.. Each unit of completed supply line and distribution system shall be thoroughly flushed and then disinfected with chlorine. Chlorine may be applied by the following method: Liquid chlorine or a completely dissolved hypochlorite and water mixture. Flushing shall be at sufficient

velocity (min. 2.5 ft/sec., where possible) to remove dirt and other foreign matter through fire hydrants or other approved blow-offs. The amount of chlorine then applied shall be sufficient to provide a dosage of not less than 25 mg/l. The chlorine material shall be introduced to the water lines and distribution systems in a manner approved by the EOR and the Authority. After a contact period of not less than eight hours, the system shall be flushed with clean water until the residual chlorine content is not greater than 0.2 mg/l free chlorine. All valves in the lines being disinfected shall be opened and closed three times during the contact period. Where necessary, the contractor shall neutralize chlorinated water which has a total chlorine residual of 0.5 mg/l or greater prior to discharging to swales, ponds, canals, storm drains, etc. to prevent environmental damage.

2. The contractor shall install sampling taps required to take all necessary water samples at points designated by the EOR, the Authority, Palm Beach County Health Department and FDEP.

3. The contractor shall make all arrangements with a certified testing laboratory to take all water samples required for bacteriological tests and shall maintain continuous running bacteriological sample taps, through an Authority approved jumper which will maintain a combined chlorine residual of not less than 0.6 mg/l. Water mains being tested must remain under line pressure, through the approved jumper, after the sample taps are turned off. This procedure shall be followed until the Palm Beach County Health Department issues a release for service of the water lines and distribution system being disinfected. Bacteriological test results will be considered invalid if the results are for samples collected more than 30 days before the results are received by the Palm Beach County Health Department and/or the pressure in the mains is not maintained at 20 psi or greater after the samples are collected.

The bacteriological test result report shall include results demonstrating initial dosage of not less than 25 mg/l and two consecutive days of satisfactory bacteriological test.

4. Palm Beach County Health Department approval including EOR's certification shall be accomplished at the full expense of the contractor/developer and shall be submitted through SUA for approval.

5. After release for service is received from the Palm Beach County Health Department and with approval from Authority, the contractor shall remove the approved jumper and cap both saddles with brass plugs. The construction meter utilized for main clearance purposes shall be returned to Authority.

G. WATER SERVICE LINE/METER INSTALLATION

1. Meter curb stops shall be 8 inches below final finished grade.

2. Meter services shall be exposed and ready for the meter to be installed.

3. Service line identification

- a. All water service line valves shall be exposed by the contractor. One 4 foot high 2 inch X 2 inch pressure treated wood stake shall be put in the earth against the plug when the service connection is backfilled. The stake shall extend 18 inches minimum above grade and shall be broken off only after authorization from Authority. The top 6 inches of the stake shall be painted blue.
 - b. A magnetic marker for water service shall be tied to the terminal end of each water service. Markers shall be Omni Marker #75025 or 3M 1403-1266 blue water marker, or equivalent.
 - c. All magnetic markers shall be returned to Authority at the time of the meter being set.
4. No meter shall be put in service until the appropriate backflow preventer has been installed and is successfully tested by the Authority.
 5. No meter shall be put in service in areas formerly on a private water supply system until Authority's representative verifies proper physical disconnection from the private system.

H. INSTALLATION - VALVES AND APPURTENANCES

1. Valving of all systems shall be designed to facilitate the isolation of each section of pipeline located between intersections of the grid system.
2. If a distribution system is to be constructed in phases, valves and plugs with a suitable blow-off or hydrant shall be installed at the end of each line that is to be extended.
3. All mains, valves, bends, tees, crosses, and dead ends shall be restrained with an approved Authority restraint joint system. On all mains greater than 12" in diameter, 2 forms of thrust restraints or an approved Authority restrained joint system shall be utilized at each joint. Where adequate spaces exist thrust blocks may be allowed with Authority approval. Thrust blocks shall be used behind all hydrants.
4. When tie rods are used as a method of joint restraint all tie back bolts, nuts, washers and threaded rods shall be constructed of materials that meet ASTM A-242 requirements (Cor-Ten steel or equal) and painted in accordance with the procedures described herein. Tie rods and nuts shall be equal in diameter to the tee bolts and nuts which were supplied with the applicable fittings. Two tie rods per joint are required for sizes 4" through 10" diameter, four tie rods per joint for sizes 12" through 16" diameter and 6 tie rods per joint for sizes 18" through 24" diameter.
5. All valves installed for future connections shall be restrained in accordance with Authority specifications.
6. Prior to installation, all butterfly valves shall be tested on site, above ground at 150 PSI. Both sides of disk shall be tested in the presence of an SUA representative.

I. MATERIALS (Also Refer To Exhibit D "Shop Specifications List")

1. Pressure Pipe - Water Mains

- a. All materials, fittings and appurtenances intended for use in pressure pipe systems shall be designed and constructed for a minimum working pressure of 150 psi unless the specific application dictates a higher working pressure requirement. All brass including, but not limited, to valves, fittings, backflow preventors, corporation stops, and curb stops shall be less than 5% lead content. All rubber parts, gaskets, etc shall be chloramine resistant. Pipe:

1. Pressure pipe in sizes 4 inch inside diameter and larger shall be ductile iron pipe.
2. Ductile iron pipe shall be Pressure Class 51 for sizes up to and including 12 inch and Pressure Class 350 for pipe sizes larger than 12 inch and shall conform to ANSI A21.51 and AWWA C-151. Pipe interior shall have a cement mortar lining.
3. Spool pieces for MJ connections shall be a minimum of 18 inches long, outside flange to outside flange.
4. Flanged pipe shall have a minimum wall thickness of 0.32 for 4 inch pipe and incremental increases of 0.02 in thickness for each increase in pipe size up to and including 14 inch. Flanged pipe over 14 inches shall require shop drawing submittal to Authority for approval.

b. Fittings:

1. All pressure pipe fittings of size 4 inch inside diameter and larger shall be ductile iron fittings with mechanical joints, unless the plans specifically call for flanged joints, restrained joints, etc. Mechanical joint fittings shall be used for buried installations. Flanged joints shall be used for aboveground service only.

Mechanical joint fittings shall conform to ANSI/AWWA C-153/A 21.53. Glands for MJ fitting shall be ductile iron and tee bolts shall be Cor-Ten steel unless otherwise specified. Flanged fittings shall conform to ANSI/AWWA C-110/A21.10 and lined inside and outside as specified for the pipe.

2. Full face neoprene gaskets shall be used on all flanged connections. The use of other materials is prohibited.

c. Thrust Blocks:

1. Provide minimum 2,500 psi at 28 days concrete thrust blocks for water mains at each fitting per detail shown on construction drawings if this method of restraint is required.

2. Pressure Pipe - Water Service

- a. The minimum size for single services shall be 1 inch.
The minimum size for double services shall be 1½ inch.
- b. Polyethylene tubing, SDR 9, ASTM D-2737, PE 3408, Cell Classification 355434 C - Latest Revision, copper tube size, with appropriate "Pack Joint" fittings is authorized for 1 inch, 1½ inch and 2 inch services.
- c. Copper tubing shall be type "K" roll copper and fittings shall be of the compression type.
- d. Copper services must be used if organic solvents are likely to be present (i.e. gasoline stations, etc).

3. Water Service - Fittings

- a. Both double strap tapping saddles and corporation stops shall have AWWA threads.
- b. "Pack Joint" fittings for use with polyethylene pipe shall be provided with stainless steel stiffeners.
- c. Both polyethylene and copper tubing shall be run in one continuous piece, from corporation stop to curb stop (i.e. no fittings between these points).
- d. Curb stops shall be 1 inch (minimum) in size. One inch curb stops with 3/4 inch valves shall not be allowed.
- e. Curb stops at the meter shall be provided with locking wings and an appropriate sized drilled swivel meter nut.
- f. Only lead free solder and flux shall be used on all soldered joints.
- g. Where service taps are made under paving or sidewalks special requirements apply which will permit access to the connection to the water main (curb valve boxes, 90° tap orientation).

4. Tapping Sleeves and Saddles

- a. Tapping sleeves and tapping crosses shall be of the heavy body ductile iron, mechanical joint or stainless steel wrap around, as approved by Authority.
- b. Tapping Saddles: No direct taps shall be allowed. All service line taps shall be supplied with corporation stops. Water service taps on the main shall be spaced at a minimum distance of 18 inches. All service taps must be at least 18 inches from a bell or fitting. (90° taps are required for services under paving or sidewalks). Brass double strap tapping saddles shall be used.

- c. All tapping assemblies installed on existing water mains shall be pressure tested and witnessed by Authority's representative prior to the actual tap of the main. The pipe coupon shall be carefully preserved and submitted to Authority's representative. All tapping sleeves shall be installed a minimum of 6 feet from pipe joints.
- d. Connection to existing water mains shall be double valved as approved by the Palm Beach County Health Department.
- e. Connection to existing water mains requires the approval and direct observation of Authority's representative.

J. FIRE HYDRANTS

1. Fire hydrants shall conform in all respects to AWWA C-502 (Latest Revision) and shall be of the dry barrel breakaway type with two 2½ inch hose nozzles and one 4½ inch pumper nozzle without drains. All nozzles shall be brass with National Standard hose threads. The hydrant shall be provided with an interior valve opening of 5¼ inch with a brass to brass threaded stationary seat. The centerline of the nozzles shall be 18 inches above the finish grade. In addition, the hydrant shall be fitted with a mechanical joint connection per ANSI A 21.11/AWWA C-111 (Latest Revision) with a minimum cover of 30 inches.
2. Each fire hydrant shall be capable of delivering a flow of 1,000 gallons per minute with a residual pressure of not less than 20 psi. Fire hydrant branches (from main to hydrant) shall be not less than 6 inches in diameter. Each branch shall be provided with a gate valve located as close as possible to the main and the hydrant shall be suitably restrained. Separate fire lines shall be valved as close as possible to the main and restrained with adequate thrust blocks. Hydrants shall be located at or near road right-of-way lines with pumper discharge nozzle facing the roadway. No obstruction shall be placed near the hydrant which would prevent maintenance or access. Hydrants that are installed in a vulnerable area shall be protected by 4-inch cement filled DIP stanchions.
3. All fire hydrants shall be free of corrosion and all working parts shall be properly lubricated and the hydrant painted as required by Authority.
4. The contractor shall provide and install only fire hydrants which conform to the above specifications and are specified in Exhibit D "Shop Specifications List".
5. Fire hydrants may be inspected in the field for conformance to the above specifications by Authority and/or other regulatory agencies.
6. Fire hydrant extensions shall not be used in new construction.
7. A seven and one half feet (7 ½) clear zone around the front and sides, and a five (5) foot clear zone around the rear of the fire hydrant shall be maintained.
8. Maintain fifteen (15) feet minimum from fire hydrant to all structures.

K. VALVES AND VALVE BOXES

1. Valves smaller than 3 inches shall be bronze ball valves and conform to Federal Specification WW-V-35B, Type II, Class A. Valve must be rated at 600 psi WOG.
2. Valves up to and including 10 inch shall be iron body, bronze mounted, gate valves conforming to AWWA C-500 (Latest Revision) being resilient wedge, non-rising stem type and appropriate ends for horizontal position in line, and shall open left (counter-clockwise) with 2-inch square operating nut. The coating on resilient wedges shall be chloramine resistant.
3. Gate valves shall be carefully inspected, opened wide, and then tightly closed, and all the various nuts and bolts thereon shall be tested for tightness. Special care shall be taken to prevent joint material, stones, or other substances from becoming lodged in the valve seat. Gate valves, unless shown otherwise, shall be set with their stems vertically above the centerline of the pipe.
4. All valves 12 inch and larger used in water mains shall be factory tested and labeled as bi-directional butterfly valves unless otherwise specified. The valves shall conform to AWWA Standard C-504, Latest Revision and shall be Class 150. All 12-inch and larger butterfly valves shall be tested on site prior to install. Each side shall be tested at 150 PSI in the presence of an Authority representative.
5. Check valves shall have a ductile iron body with a bronze or stainless steel to red rubber silicone seating arrangement, non-corrosive shaft. Fireline checks shall have a 300 psi hydrostatic test pressure rating. Check valves smaller than 4 inches shall be bronze, bronze disc, conforming to Federal Specification WW-V-51E, Type 4, Class A, 125 pressure rating.
6. Air release valves installed below grade shall be of the manual type unless otherwise specified by Authority. Air release valves shall be installed in a concrete manhole as shown in the detail and conform to manhole requirements as outlined in Section IV D.
7. Cast iron valve boxes shall be provided for all valves installed underground. The boxes shall be adjustable to fit the depth of earth cover over the valve and shall be designed and installed so as to prevent the transmission of surface loads directly to the valve or piping.
8. Valve boxes shall be carefully centered over the operating nut of the gate valves so as to permit a valve key to be easily fitted to the operating nut. The tops of valve boxes shall be set flush with finished grade, with allowance made for the settlement of surrounding backfill or surface. An 8-inch thick concrete collar shall surround the top of the valve box, as shown on Authority's Underground Valve Installation Construction Detail Drawing.

L. METER AND METER BOX

1. All meters shall be obtained from the Authority and remain the property of the Authority.

2. A meter fee shall be collected by Authority from the Developer/Customer requesting the desired service prior to the actual installation of the meter.
3. Authority shall furnish and install all meters and meter boxes for meter sizes up to and including 2 inch.
4. The Developer/Customer shall be responsible for resetting the meter box after the meter has been set initially by Authority. Any damage to the meter box or meter set shall be paid for by the Developer/Customer.
5. The design of all 3 inch and larger domestic, fire line and irrigation water meter/backflow prevention device installations shall be handled on a case by case basis. Compound water meters must be utilized for all projects that will have variable water demands. All installations shall conform to Authority's Construction Standards and Specifications. The EOR shall submit detailed drawings covering the proposed installation showing the type of material to be used in constructing the meter enclosure, relative positioning and dimensions of all meters, devices, etc. to be placed within said enclosure to Authority for approval. It shall be the contractor's responsibility to furnish and install all materials required to construct the specific meter/backflow device/enclosure installation according to the approved detail drawings.
6. The above grade piping of the metering and backflow devices larger than 2 inch shall be coated as outlined in Section II.

M. BACKFLOW PREVENTION DEVICES

The contractor shall provide and install the appropriate type backflow prevention device as specified in Exhibit D "Shop Specifications List".

N. ON-SITE MORTAR/CONCRETE/GROUT MIX

1. All concrete and/or mortar mixed on site (field mixed) for use on any component of the water distribution system shall be made with Type II Portland cement, masonry sand, clean properly sized aggregate (if required) and clean potable water. In no case shall local on-site sand/dirt, rock or stones or non-potable water be used.
2. When cement asbestos pipe is to be abandoned in place, the pipe must be grouted full by pumping in an approved grout mix. The procedure must comply with all applicable regulations and shall be the Developer's responsibility.