ORDINANCE 2017-01

AN ORDINANCE OF THE CITY OF SMYRNA, GEORGIA, PROVIDING FOR THE AMENDMENT OF THE CODE OF ORDINANCES OF THE CITY OF SMYRNA, APPENDIX D, SECTION 5 – WATER SYSTEM DESIGN, MAINTENANCE AND HAZARD REDUCTION PROCEDURES; DESIGN SPECIFICATIONS FOR STORM DRAINAGE, ROADS, CONSTRUCTION BY ADDING SUBSECTION (q) DISTRIBUTION SYSTEM FLUSHING AND AMEND SUBSECTION (k) DISINFECTION (1) MAIN REPAIRS: BY ADDING SAMPLE COLLECTION TESTING.

Appendix D Design Specifications for Storm Drainage, Roads, Construction

Section 5:

WATER SYSTEM DESIGN, MAINTENANCE AND HAZARD REDUCTION PROCEDURES

(a) Goals:
The City of Smyrna operates and maintains approximately 240 miles of water distribution lines. The City of Smyrna operates and maintains a distribution system only and buys their water from Cobb County Water System and the Cobb Marietta Water Authority and distributes the water to the Smyrna customer. Currently water treatment and pressure is provided by the CCMWA.

The purpose of this document is to establish construction, maintenance and operations standards that reflect constant growth, changing hydrologic conditions and system age. System goals are to:

- **Properly maintain and operate the water distribution system at all times.**
- **Provide specific construction requirements for system renewal and extension.**
- **Provide adequate capacity and pressure for all parts of the distribution system.**
- **Properly administer and enforce backflow prevention throughout the City of Smyrna distribution system.**

(b) ORGANIZATION:

The City of Smyrna Water System is comprised of two operating groups: Water Administration and Water Distribution. The Water Administration activities are responsible for the business services of the system, system meter reading and meter system change out.

Water Distribution is responsible for system maintenance and engineering. Responsibilities include system design, preventive maintenance, system repair and system replacement. System location and identification is accomplished by GPS methods and flow testing and hydraulic modeling to establish system flows and capacity.

(c) OPERATIONS:

System operations are conducted by both Water Distribution and Water Administration. All calls originated from customers, the general public and other agencies are logged into the City of Smyrna utilities management systems. Once logged the appropriate personnel or division is notified to identify, assess and correct the problem. The City of Smyrna maintains emergency on call staff and on call contracting for all after normal working hour's situations. The City of Smyrna Emergency 911 dispatch center maintains dispatch for after hours on call water distribution staff. Both 911 dispatch and water distribution maintain an emergency contact and call down list for emergency situations.

(d) MAINTENANCE:

System Maintenance is a collaborative responsibility of both Water Administration and Water Distribution.

(1) Water Administration performs the following functions:

- **All business administration of the Smyrna Water Distribution System.**
- **Monthly reading of all system meters.**
- **System meter replacement and calibration annually.**
- **System odor, taste and color complaint response and testing.**
- **Ensure monthly operation/monitoring reports are conducted as required by permit.**

(2) Water Distribution performs the following functions:

- **Data, work order and records management for Water Distribution System.**
- **New meter installation ¾" through 2 ½".**
- **Administer contract for new meter installation 3" through 10".**
- **System repairs to distribution services, mains and hydrants.**
- **Operation of system valves to ensure proper working condition.**

- **System mapping annually and updated to include location, size, material type, valve locations, fire hydrants, dead ends, installation date, system flow and pressure.**

- **Cross Connection control Program update and implementation.**

- **System flushing and flow testing.**

- **System replacement due to age, water quality and system capacity.**

- **Periodic leak detection to reduce system leakage.**

(e) DISTRIBUTION SYSTEM DESIGN:

(1) The City of Smyrna distribution systems shall be designed to the following design standards. Installation of distribution water lines and appurtenances, other than by the City, shall first be submitted by way of construction drawing. Construction drawings shall meet the City of Smyrna design standards in order for approval to be given by the City. Design flow for all new installations shall be a minimum of 1000 gpm @ 35psi residual. Only after plan approval shall the installations of distribution water lines and appurtenances begin.

(2) Piping shall not be laid on exposed rock or aggregate and all backfill is required to be clean and free of rocks. Bed fill shall be compacted to a minimum of 95% standard proctor. All changes in direction including tees, bends, caps, plugs, hydrants and other fittings are to be thrust blocked to prevent leakage and or separation of joints.

(f) FLOW TEST:

(1) Before acceptance by the City, the water and or utility contractor shall have hydrant flow tests performed on all hydrants installed. This test will be conducted in the presence of the City of Smyrna site development inspector. Tests shall be conducted by an approved testing company and shall include flow, GPM, static pressure, pitot reading and hydrant type, year and location. Results shall be submitted to the site inspector in writing when complete.

(g) VALVES

(1) All required valves throughout the distribution system are required to be M & H mechanical joint gate valves with wrench nuts. Valves shall be right hand operation only. Valve spacing shall be a maximum of 1000 ft with valves installed at all intersections where change in direction occurs. Valve boxes are required for each valve including concrete valve pads installed to grade. Valves boxes that occur in roadways will be flush with top of pavement. Valve boxes shall not occur within a curb line.

(h) DEAD ENDS

The installation of water mains shall not cause a dead end. A loop shall be provided at such dead ends with 2 ½" PVC 200 psi water line #1120, ASTM D 2241. The line shall be valved with a 2½ inch Ford Gate Valve with wrench nut. The PVC water line shall be wrapped with a continuous No. 6 insulated copper wire and terminate in each valve box to enable access for electronic locating. Fire hydrants shall be located at the dead ends and cul-de-sac's for distribution system flushing.

(i) SERVICE LINES

(1) All service lines shall be individual, one service per single-family structure, and a minimum of ¾ inch type K continuous copper tubing. The water main shall be dry or wet tapped. All taps will be @ 90 degrees from top center using a tapping saddle and tapped through a corporation stop. Approved manufactures for tapping saddles are JCM, Smith-Blair or Ford. Approved manufactures for curb and corporation stops are AY McDonald or Ford. Top taps shall not be allowed.

(2) The service piping shall terminate with an approved curb stop, flare or compression and be in an approved meter box. Carson Industries are approved meter box manufactures. Meter sizes ¾" – 1" require a model 1419 box w/General Foundries 51712wm lid. Meter sizes 1 ½" – 2 ½" requires model 1730-18 meter box w/lid. Meters 3" and larger shall be installed in meter vaults manufactured by Old Castle and have recessed flush lockable aluminum lids. Meter boxes shall be placed at the R/W line in front of the property served, perpendicular to the street and at finished grade. No meter box shall be located in driveways or roadways. The City of Smyrna shall set all meters after the purchaser makes a request. Meters will only be set in a meter box with an accessible and exposed curb stop. All water use shall be metered including fire lines and sub-metering read by a third party where at all possible. City meters are ARM with leak detection capability. All meter sets shall include two meter couplings. No customer service shall be attached to a meter without the use of a meter coupling.

(3) The developer, purchaser and or contractor shall be responsible for the final placement of all meter boxes when finish landscape does not exist during placement of meter. Meter shall be centered in meter box and bottom of meter shall be at bottom of meter box elevation.

(j) TESTING FOR SOUNDNESS AND TIGHTNESS:

(1) After water main piping is installed all sections shall be filled, air shall be released from the system through curb stops and hydrants, sit idle for at least 24 hours before the test starts. The pressure shall be brought up to 150 psi by using hydrostatic equipment and maintained for a period of 4 hours. Any loss of

pressure will indicate leakage. When leakage occurs repairs shall be made and the test repeated until 150 psi is maintained for four hours.

(k) DISINFECTION:

(1) MAIN REPAIRS:

If repairs are made under continuous pressure no disinfection is required.

When mains are required to be opened all trenches shall be dewatered. All pipe, fittings and materials used in the repair shall be flushed and swabbed with a 5 percent hypochlorite solution. System flushing shall occur after repairs are made. The main shall be disinfected if practical using a 500 mg/l dose of sodium hypochlorite with 30 minute contact time. Flushing after disinfection is required until a chlorine residual of less than 1 mg/l is obtained. Samples must be collected and tested for satisfactory microbiological quality prior to placing line into service.

(2) NEW MAINS:

Every effort shall be made to prevent the contamination of newly installed water mains. Materials such as dirt, construction debris, animals, rodents, dirty water, etc., shall be kept outside the water main using every effort possible while the main installation is in progress.

All mains shall be flushed completely at a minimum velocity of 2.3 ft/sec. for at least 30 minutes, before the disinfection process is performed. Disinfection of new water mains shall be accomplished by the continuous method only. Sodium Hypochlorite at 15 percent available chlorine or calcium hypochlorite at 65 percent available chlorine is approved liquid chlorination methods.

The chlorine dose after injection shall be at 50mg/l at all sampling points of the water main. Once obtained a minimum contact time of 24 hours is required. After contact time minimum chlorine residual of 25 mg/l shall be obtained at all sampling points. Failure to obtain a minimum of 25 mg/l shall result in a repeat of the chlorination process. The water and or utility contractor shall be responsible for having all chlorination testing performed and shall use a certified laboratory to validate test results. All sampling is required to be conducted in the presence of the Smyrna site development inspector or his designee. The City of Smyrna shall be copied on test report.

After disinfection of a new water main the system shall be flushed to produce a chlorine residual of less than 1mg/l. A bacteriological test is now required. The water or utility contractor is responsible for this test, which shall be obtained and tested by the Cobb Marietta Water Authority in the presence of the Smyrna site development inspector or his designee. Failure to obtain a negative bacteriological test shall result in a repeat of the chlorination process. The City of Smyrna shall be copied on test report.

All water with a chlorine residual greater than 1mg/l shall be disposed of in the following manor:

a. Sanitary Sewer System, after notification to the City and waste treatment plant operator.

b. Storm Sewer, after de-chlorination or chlorine residual is below 1 mg/l

c. Land disposal where adequate dilution and travel time will result in a chlorine residual of less than 1 mg/l.

(l) MAIN LINES

(1) Water Distribution System main lines shall be ductile iron pipe class 51. Minimum pipe size shall be 8". Fire Hydrants shall be installed according to current NFPA Standards but shall be spaced no more than 500 feet apart. The City of Smyrna Fire Marshall may modify hydrant spacing. All hydrants shall be M & H or U.S. 3 (three) Way, nozzle sizes 2, 2 ½" NTS and one (1) 4 ½" NTS. Hydrant barrel size shall be a minimum of 5.25. New hydrants are required to be painted silver by the manufacture. Each hydrant shall have an M & H hydrant grate valve installed with complete valve box and concrete valve pad to finish grade. No fire hydrant shall be buried below the hydrants bury line. Anchor couplings and thrust blocking is required on all fire hydrants and hydrant leads.

(m) LOCATION:

(1) Water Mains shall only be placed in the City right-of-way that is designated as the water and gas zone. Water mains shall be placed between 3 feet back of curb and 9 feet back of curb. Gas Mains sharing the water and gas zone shall be placed between 9 feet back of curb and 11 feet back of curb. No other utility shall share the water and gas zone other than to cross perpendicularly. Any utility crossing a water main perpendicularly shall be under the water main and shall not be in contact with it.

(2) All water mains shall be buried between a top of pipe depth elevation of four and five feet unless otherwise approved by the City of Smyrna water department.

(n) TAPS:

All main on main taps shall be approved by the City of Smyrna prior to installation. Wet taps require an M & H MJ tapping sleeve and valve. All cut in taps shall be installed with a mechanical joint tee, valve and two 12" MJ sleeves.

(o) CROSS CONNECTION CONTROL:

In order to protect the public potable water supply systems against actual or potential cross connections, backflow and back-siphonage all commercial water customers are required to have their backflow and back-siphonage devices tested annually. The City shall notify by mail all commercial water accounts during each November billing period of the requirement for testing. Test reports for each commercial water account are required to be submitted no later than the end of February each year.

Commercial Water accounts customers who do not have cross connection control devices shall be required to install the proper device based upon the potential hazard that may exist. All cross connection devices, backflow and back-siphonage devices shall be installed in accordance with the City of Smyrna cross connection control program. Devices required by the City or the Cross Connection control Program that are not installed will result in discontinuance of water service.

Records of all devices, tests and locations shall be kept and recorded annually. All backflow device testers shall be certified as require by the EPD.

(p) VIOLATIONS and ENFORCEMENT:

(1) It shall be unlawful for any person, user or customer to violate any provisions of this section. Violations shall be subject to the penalties contained in section 1-8.

(2) Noncompliance. If it is determined that the user has failed to comply with the provisions of this section, a written notice of violation shall be given to the user, the contractor named in the permit, or the user's authorized agent. If the user is not a customer (e.g., if the user is a tenant in a master-metered development), then the customer for the property on which the user is located shall receive a copy of the notice of violation. The notice shall set forth the violation and the measure needed to achieve compliance. The user shall be given a reasonable time frame to comply. Where an emergency exists, a written warning shall be given to the user, and user will have 24 hours to comply.

(q) DISTRIBUTION SYSTEM FLUSHING:

(1) All flushing activities shall require a preplan. The plan will include locations, day hours between 7:00 a.m. and 4:00 p.m. or evening hours 9:00 p.m. and 5:00 a.m. and a MUTCD Plan.

(2) Preplan main section to be flushed, valves to be used in section and order pipeline will be flushed.

(3) Pipeline flushing shall use the unidirectional method , therefore starting at the supply and working outward.

(4) Minimum flushing velocity is 2.5 ft./sec. unless circumstances will not permit do not flush a large main supplied by a smaller main.

(5) Prior to flushing, notification is necessary to all customers that will be affected. Pay specific attention to where dialysis equipment may be located, hospitals, restaurants and laundromats.

(6) Sections to be flushed shall be isolated from the rest of the system. All valves shall be closed slowly to prevent water hammer.

(7) Open fire hydrants and or blow off valves slowly.

(8) Flushing shall be directed away from traffic, pedestrians and private property.

(9) Hydrant and or blow offs shall be opened fully to stir up sediments inside the water main (usually 5 to 10 minutes) usual line flushing is for at least 30 minutes.

(10) Ensure system pressure in the area does not drop below 20 psi.

(11) Records shall be kept for each flushing operation to including appearance and odor of the water flushed.

(12) Collect 2 water samples for comparison, First sample at about 2 to 3 minute after hydrant was opened and one just before hydrant is closed. These samples check for basic water quality such as iron, chlorine, residual, and turbidity.

(13) After flushing of fire hydrant or blow off valve, close hydrant or blow off valve slowly.

(14) In areas where water may not clear completely, collect water bottle samples to judge when to shut down.

(15) Closing and opening of valves should be marked and erased on a map to ensure all valves are open when complete.

(16) After flushing one section of the pipe, move to the next section to be flushed and repeat the same procedures.

1000 LF 8" DIP WITH AN INITIAL 50 MG/L DOSE OF CHLORINE

$$\frac{(.785)(8 \text{ in.})2 \quad (1000 \text{ ft.})\ (7.48 \text{ gal/cu. ft.})}{144 \text{ sq. in. / sq. ft.}}$$

$$= \quad 2610 \text{ gal. of water}$$

$$(.00261 \text{ m/gal.})\ (50 \text{ mg/l})\ \ (8.43 \text{ lbs/gal.})$$

$$= \quad 1.1 \text{ lbs Chlorine}$$

$$\frac{\text{(1.1 lbs.) (100\%)}}{\text{(8.43 lbs/gal) (5\%)}}$$

= 2.6 gals or approx. 3 gals. 5%
Sodium Hypochlorite Solution

Example continued

$$\frac{\text{(1.1 lbs) (100\%)}}{\text{(8.43 lbs./gal) (15 \%)}}$$

= .89 gals or approx. 1 gal 15%
Hypochlorite Solution

$$\frac{\text{(1.1 lbs) (100 \%)}}{\text{(8.34 lbs/gal) (65 \%)}}$$

= .21 gals or approx. .5 gals of 65 %
Calcium Hypochlorite Solution

Approved by Mayor and Council this 17th day of January 2017.

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A. Max Bacon, Mayor

Attest:

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Terri Graham, City Clerk

Approved as to form:

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Scott Cochran, City Attorney