June 7, 2012

To: Developers, Contractors, and Engineers

Subject: Waterline Flushing and Disinfection Procedures

Enclosed please find information regarding the Waterline Flushing and Disinfection Program in the City of Goodyear. The Flushing and Disinfection program provides a means by which contactors can obtain potable water for the flushing and testing of new water lines that will be connected into the City of Goodyear water system.

Also included in the enclosed herein is the City's procedure regarding Flushing and Disinfection of Water Mains.

The information contained herein will become effective on construction permits issued on or after June 7, 2012.

This information is also available on the City of Goodyear website: www.goodyearaz.gov

I hope that the information provided is informative and helpful to developers, contractors, and engineers doing work in the City of Goodyear. If you have any questions or require additional information, please call 623-882-7979 or email comments and questions to the Engineering Department at gyeng@goodyearaz.gov

Sincerely,

David J Ramirez

David J. Ramirez
City Engineer

City of Goodyear

Flushing and Disinfection of Water Mains

06/07/12

The City of Goodyear requires that all contractors working in the City adhere to the following guideline for new water main disinfection to prevent contamination of the City's potable water system. The disinfection of all water mains shall be in compliance with AWWA C651-05, the current edition of MAG Specifications, and this guideline. Personnel performing flushing and disinfection procedures shall be properly trained and be familiar with AWWA Standards. This standard was written for water lines owned and operated by the City of Goodyear. Flushing and disinfection of water lines owned and maintained by private water companies shall also adhere to their guidelines and standards.

Valve Operation

At no time will contractors be permitted to open or close any valve tied into the City's water system. Only authorized City personnel can operate these valves for any purpose, which may include disinfecting, flushing, placing a new water main into service, and placement of water meter boxes.

Once a new main is connected to the City's water supply, only authorized City personnel are permitted to close valves for the purpose of isolating water lines to facilitate construction or emergencies. Contractors shall coordinate operation of valves with the City Inspector assigned to the project. Operations which require opening or closing of valves shall be scheduled with the Public Works Department through the City Inspector a minimum of 48 hours prior to the work being performed.

If an emergency shutdown is required, call the City of Goodyear's Public Works Department at 623-932-3010.

Isolation of New Water Mains

At all times, the new main shall be isolated from the active distribution system by physical separation until disinfecting water has been flushed out and satisfactory bacteriological testing has been completed in accordance with AWWA Standard C651-05. Water needed to fill the new main for testing and flushing purposes shall only be potable City water, supplied through a temporary connection and protected by a backflow device. The device shall be constructed per City of Goodyear Detail G-3356.

Protection of Pipe, Valves, and Fittings

At all times, the Contractor shall protect valves, fittings, and the interior of pipe against contamination. Stockpiled material shall be stored off the ground to minimize the entrance of foreign material and mud. During placement, openings shall be covered with watertight plugs at the close of the day's work or during short stoppages of work such as rest breaks. If at any time after placement, stormwater enters the pipe, then corrective measures shall be taken per AWWA C651-05 section 4.3.8.

Loading the Main for Pressure and Leak Testing

Once the water main and all appurtenances have been installed and the Inspector has received confirmation that the trench backfill has passed compaction requirements, the City will permit the main to be loaded for testing. No section of main greater than ½ mile in total pipe length shall be tested unless otherwise approved by the City of Goodyear Engineering Department and/or the Public Works Department**.**

The Contractor shall utilize a reduced pressure type backflow prevention device with a metering device to supply potable water through a temporary connection to the new main from an existing City water source. The device shall be tested and certified by a State Certified Tester prior to use and anytime the device has been repaired or maintenance performed. As a minimum, the device shall be certified within one year of use. A copy of the certification shall be given to the City Inspector and a copy shall be kept on site attached to the device at all times. No device shall be connected to the City source until approved by the City Inspector and shall be immediately removed once the bacteriological sampling has been completed. All pipe and connectors between the existing City main and the backflow device shall be disinfected per AWWA C651-05 prior to use. The device shall be physically separated from the new main during hydrostatic pressure testing. The City requires that the device has a lockable feature to prevent misusage. Valves shall be closed at the end of each shift and when not in use.

Flushing

The City requires that mains be cleared of all debris and soil that may have accumulated during construction prior to starting the disinfection process. The most practical way to achieve this is to flush the main. Only potable City water can be used to fill and flush potable water lines.

From the point of the temporary tie in, potable water from the City's system will be utilized to flush the new main. The main shall be flushed at a minimum velocity of 2.5 feet per second. The Contractor should refer to City of Goodyear Detail G-3356 to determine the inlet and outlet pipe size requirements to achieve the required velocity. Once flushed, the Contractor may continue with disinfection of the main. At least 48 hours prior to the filling and/or flushing of any potable water line, the Contractor must contact the City Inspector to coordinate with the Public Works Department the use of potable water.

Disinfection of Mains

Chlorination of all water mains shall be per AWWA C651-05. The method of chlorination used by the Contractor shall be approved by the City Inspector prior to use. The Contractor is responsible for supplying equipment such as a pitot gauge, meter, or similar devices to verify proper chlorination procedures are performed per standards.

The water shall be chlorinated so that after a 24-hour holding period in the main, there will be a minimum free chlorine residual of 10 mg/L, unless at any time after placement, stormwater enters the pipe, then corrective measures shall be taken per AWWA C651-05 section 4.3.8 and sampling shall be per section 5.1.2. This minimum concentration is to be present at all risers. Each riser is to be flushed to ensure the chlorine solution contacts all portions of the pipe.

In the presence of the City Inspector, valves, hydrants, and all other appurtenances that are part of the new system shall be operated while the line is filled with the chlorine solution.

At the end of the 24-hour period, the City Inspector will verify that treated water in all portions of the main have a minimum concentration of 10 mg/L chlorine prior to flushing for bacteriological testing.

After confirmation of the 10 mg/L minimum chlorine residual, the Contractor may be permitted to flush the line; flushing shall be coordinated with the Public Works Department through the City Inspector. Flushing is typically limited to the off-peak usage hours of 10:00am to 2:00pm, or as determined by the City Inspector and the Public Works Department. Flushing shall continue until the replacement water throughout the new pipeline can be proved, by laboratory testing, comparable in quality to the water served to the public from the existing water system.

If residual chlorine levels exceed 50 ppm, the Contractor will be required to use a neutralizing agent or diffuser to neutralize the chlorinated water during discharge. Refer to AWWA C651-05 Appendix C.

Bacteriological Testing and Acceptance

After disinfection of the main is complete and the main flushed, the Contractor will schedule testing to verify the absence of coliform organisms and HPC bacteria. The City Inspector shall determine the locations where the Contractor will place the sample risers.

The number of sampling locations shall be as follows:

- Waterlines up to but less than 150 feet in length require one sampling riser installed as near the end as possible;
- Waterlines 150 to 300 feet in length, two sampling risers, one near each end of the line;
- Waterlines 300 to 3,000 feet in length, a minimum of three sampling risers;
- In addition, dead ends on main lines should be represented with a sampling riser;

- If any trench water has entered the main during construction, then additional risers shall be placed to conform with AWWA C651-05, section 5.1.2

The Contractor is responsible for hiring an independent lab for the sampling and testing of water in the new main. The lab performing sampling shall obtain samples in the presence of the City Inspector.

The lab shall be certified by the State of Arizona for testing water quality. All sampling and testing shall be in accordance with Standard Methods for the Examination of Water and Wastewater. The first sample shall be taken within 24 hours of flushing the new main. A second set of samples shall be obtained 24 hours after the first set of samples are taken. A copy of the test results along with a Chain of Custody form shall be submitted to the City Inspector.

Connection of New Main

Once approved by the City Inspector, the Contractor will be required to connect the new main to the existing City water supply. The Contractor shall make all required connections within 3 days of notification. The City Inspector will coordinate the work through the Public Works Department.

Connection pieces shall be disinfected per AWWA C651-05 section 4.6 in the presence of the City Inspector. Once all connections are complete, the City Inspector will arrange for the main to be placed into service.

City of Goodyear

Waterline Flushing and Disinfection Program Summary

Revised 08/1/12

Beginning June 7, 2012, all newly installed water infrastructure located in the Goodyear service area (typically south of I-10) will require a City-issued flushing and disinfection meter. This meter will help accurately account for the state-mandated Annual Water Withdrawal Report and recover the cost incurred for supplying and delivering flushing and disinfection water. The meter will be installed in conjunction with the required backflow prevention device and used for any filling, flushing, chlorination, etc. of new water infrastructure.

The following summarizes how a meter may be obtained, installed, relocated from its original installation, and returned after use. More detailed information is contained in the forms, agreements, and procedures that follow.

1. When the Contractor/Developer has installed new water infrastructure, and is ready to fill and flush the new water line, they will need to coordinate with their City Inspector. The City Inspector will direct the Contractor/Developer to install a temporary jumper connection of the appropriate size per City of Goodyear Standard Detail G-3356.
2. The temporary jumper connection requires the use of a backflow prevention device that is to be supplied by the Contractor/Developer. The backflow device must be certified once the assembly is installed and prior to use. Units may be purchased or rented by the Contractor/Developer.
3. The City Inspector will sign and issue a Flushing and Disinfection Meter Verification Form to the Contractor/Developer. The form will indicate what size meter should be obtained from the City.
4. The Contractor/Developer will take the signed Flushing and Disinfection Meter Verification Form to the City of Goodyear Finance Department located at 190 N. Litchfield Road and pay the deposit for a meter. **Note: Ensure that whoever brings in the form has the means to pay the deposit.**
5. In conjunction with paying for the meter deposit, the Contractor/Developer must fill out and sign the Construction Meter Service Application and the Construction Meter Agreement. Both forms are available at the Finance Department.
6. Within five (5) business days after paying the deposit, a representative from the Public Works Department will contact the Contractor/Developer to schedule a location and time to deliver the meter.
7. When the meter is delivered, the Contractor/Developer will sign for the meter accepting responsibility for it. **Note: It is the Contractor's/Developer's responsibility to install the meter per City of Goodyear Standard Detail G-3356 once the meter is delivered.**

8. Once the meter, backflow, and temporary jumper assembly has been installed, it is the Contractor's/Developer's responsibility to coordinate energizing of the assembly with their City Inspector. **Note: Water will not be supplied to the assembly or the new infrastructure until this is done.**
9. If the meter needs to be relocated to a different site, the Contractor/Developer will need to have their City Inspector issue a new Flushing and Disinfection Meter Verification Form.
10. If the new site requires the same sized meter that has already been obtained, the Contractor/Developer shall fax a request, on company letterhead, with the meter number, current location, and desired new location along with the new Flushing and Disinfection Meter Verification Form to 623-932-2171.
11. If the new location requires a larger sized meter than the one already obtained, the Contractor/Developer will need to terminate service to the meter by filling out, signing, and faxing the Construction Meter Service Termination Form to 623-932-2171. The new Flushing and Disinfection Meter Verification Form must be taken to the Finance Department and processed as a new meter request.
12. When the use of the meter is complete and needs to be removed, the Contractor/Developer will need to terminate service to the meter by filling out, signing, and faxing the Construction Meter Service Termination Form to 623-932-2171.
13. Contractor's deposit will be returned after all outstanding amounts due have been paid and the City is fully reimbursed for any damage to or theft of the Meter(s), as defined in the Construction Meter Agreement.

All requests related to new water infrastructure shall be coordinated through the Contractor's/Developer's City Inspector.