

SEQUENCE OF CONSTRUCTION, TESTING, AND FLUSHING OF NEW WATERLINE

1. Lay New Waterlines and Appurtenances - Construction should begin in the proximity of existing waterlines to facilitate future installation of the double check with gate valve and testing corporation stop assembly (i.e. jumper) and tie-in. Connection to any existing waterline is not allowed until contractor is ready to test new waterlines prior to placing them in service unless jumper is a **certified** backflow preventer. Coordinate acceptable “backflow” assembly with DPU inspector prior to commencing work. Contractor shall be responsible for all labor and equipment required for flushing, dechlorination, erosion prevention, and repair of any damage caused by any and all waterline flushing prior to issuance of tentative acceptance by Hanover DPU.

2. Initial Flush – Initial flushing of new waterline(s), including all hydrants and dead-end waterline(s), may commence after jumper has been installed and connection to the existing waterline is complete. A safe and stable discharge that allows the use of a pitot gauge for flow measurement must be provided. DPU personnel will verify that initial flushing is properly performed and all air and debris have been removed from the new waterline. All waterlines shall be initially flushed at a minimum rate of 2.5 feet per second (fps) and for the duration necessary to provide a minimum of 2 complete water turn-overs within the new waterline(s). The following table is provided as a guideline for achieving the required 2.5 fps velocity and water turn-over rates. Initial flush requirements for pipe diameters larger than 16” will be determined on a case-by-case basis as approved by DPU personnel.

| Main Size | 4” | 6” | 8” | 12” | 16” |
|--------------|------|------|------|------|-------|
| Flow (gpm) | 98 | 220 | 400 | 900 | 1,500 |
| Gallons/Foot | 0.65 | 1.47 | 2.61 | 5.87 | 10.44 |

3. Pressure Test - Conduct pressure test consistent with Hanover County DPU standards and as directed by DPU inspector.

4. Disinfection - Liquid sodium hypochlorite shall be used. **Use of calcium hypochlorite granules or tablets is prohibited.** The disinfection solution shall be fed at a continuous rate and mixed with the water entering the pipe from the existing system so that the chlorine concentration of the water and disinfection solution in the pipe is elevated to and maintained at a minimum concentration of 50 mg/l available chlorine.

5. Low Flow Flushing - Low flow flushing shall not begin until the disinfection solution has been in the new waterline for at least 24 hours and a satisfactory chlorine residual has been verified by DPU personnel. Low flow flushing is a low velocity flush of approximately 1 fps and shall be maintained long enough for the disinfection solution to be entirely removed from the new waterline and the normal distribution system chlorine concentration is observed. Low flow flushing shall not end until the water is visibly clear. DPU personnel will verify that low flow flushing is properly performed.

6. Bacteriological Testing - Bacteriological testing shall be completed no earlier than two weeks prior to the scheduled issuance of tentative acceptance. Bacteriological test sampling shall be conducted in the presence of DPU personnel. **At least two samples shall be collected and tested by a State of Virginia certified laboratory. The two samples shall be collected at least 24 hours apart at pipe intervals determined by the inspector (not exceeding 2,000 feet apart and at the end of all branch lines and cul-de-sacs). The contractor shall be responsible for the expense and coordination of the sample collection and testing.** Two consecutive negative tests for coliform from all the sample locations shall constitute adequate disinfection of the new waterline(s). Originals of all applicable documentation and test results must be provided to DPU inspector prior to issuance of tentative acceptance and proceeding to Step #7.

7. Removal of the Jumper and Final Flush - Once DPU approval has been granted the contractor may remove the jumper and perform needed flushing on the new waterline to remove any remaining air and debris. DPU personnel will flush existing county waterlines as necessary and verify that contractor’s flushing of the new waterline (s) is adequate.