

SECTION UC-170**CLEANING AND TESTING OF MAIN****PART 1 - GENERAL**

1.01 SCOPE OF WORK

- A. The Contractor shall furnish all material, labor and equipment necessary to clean and test force main and/or water main.
- B. The material herein specifies cleaning and testing of mains 24-inches in diameter and less unless otherwise allowed by the MD-WASD.

1.02 RELATED SECTION

Section UC-175 - Disinfection of Main
Section UC-370 - Cleaning and Testing Gravity Sewers

1.03 QUALITY ASSURANCE

- A. Testing shall be in accordance with ANSI/AWWA Standard C-600, latest edition, as modified herein.
- B. Cleaning and testing shall be performed in strict accordance with these specifications.
- C. The Contractor is cautioned that Miami-Dade County or other governing body having jurisdiction over the work location may have regulatory rules and ordinances prohibiting or limiting the discharge of water from any excavation into sanitary and storm sewer systems, or to canals and drainage ditches. The Contractor shall comply with all regulations of all governing agencies.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 GENERAL

- A. As soon as the installation of each run of main is completed, including valves sufficient for control and anchored sufficiently to withstand any test pressure, the run shall be thoroughly cleaned by pigging (or, if required by the MD-WASD, flushing), discharging the water through a riser into the pipe trench, unless some other method of disposal is approved by the MD-WASD. Note that in some circumstances it may be necessary to install valves after the line segment has been pigged. In such an instance, permission to use this sequence of operations must be approved in writing by the MD-WASD.

- B. THE Contractor shall clean the inside of the main in intervals during its installation. The Contractor shall utilize pigging to clean the main unless otherwise specified herein or instructed by the MD-WASD. A Bare Swab No. 5, density 1 lb./ft.³ by Knapp Polly Pig, Inc. 1209 Hardy Street, Houston, Texas 77020, 1-800-231-7205, or approved equal, shall be utilized for this work. Any damage to the pipe lining caused by pigging shall be repaired or replaced to the satisfaction of the MD-WASD at the Contractor's sole expense. The Contractor shall furnish all materials and equipment necessary to clean the mains.
- C. Volume flushing, if required, shall be of sufficient velocity to produce a scouring action in the main meeting the approval the MD-WASD.
- D. The Contractor shall furnish and install all piping necessary to dispose of the flushing water and shall exercise care to prevent any damage to the surrounding area and adjoining and adjacent properties.
- E. Water Main: Mains shall be tested as a whole or in sections between line valves, unless otherwise specified or approved by the MDWASD. Unless otherwise approved by the MDWASD, the total length of pipe for any single test shall not exceed 2,000 feet. Where a segment is being tested which includes more than one line valve to line valve section the maximum allowable leakage, defined below, shall be based on the length of the small segment being tested. All offset connections, fire hydrants, fire hydrant branch mains, and services between line valves shall be tested with the water main.
- F. Force Main: The force main shall be tested in a manner identical to the water main test specified above. Offset connections and blow offs will be tested along with the main. Corporation stops shall be installed prior to testing and shall be included in the test with no leak permitted.

3.02 WATER FOR CLEANING AND TESTING

- A. Water for cleaning and testing shall be furnished as specified in "Water Used in Construction" of Section 01100. The Contractor shall furnish and install all necessary pumps, piping and fittings, including the corporation stop(s), to connect the section under test to the source of water. The test pump shall be a centrifugal or gear pump producing a steady pressure free of pulsation. The MD-WASD may furnish a suitable meter or container for measuring the flow of water into the line, if available and requested by the Contractor in a timely manner, but will not be considered as obliged to do so. If the meter is not furnished by the MD-WASD, a meter or container, calibrated to the satisfaction of the MD-WASD shall be provided by the Contractor. A Contractor-supplied meter or container must be approved in writing by the MD-WASD. The test pressure shall be 100 psi and, as specified in AWWA C600, Section 5.2 "Hydrostatic Testing", shall not vary more than ± 5 psi for the duration of the testing.

3.03 LEAKAGE TESTING

- A. Force Main: All corporation stops and blow offs in the section being tested shall be opened and left open until water comes out of them, in order that as much air as possible may be removed from the line.

- B. Water Main: All fire hydrants, corporation stops, air release valves and meter valves in the section being tested shall be opened and left open until water comes out of them, in order that as much air as possible may be removed from the line.
- C. Water shall be pumped into the line from a MD-WASD approved calibrated container or through a MD-WASD approved meter up to the required pressure, and pumping shall be continued to maintain that pressure for a minimum period of 2 hours, or such longer period as the Inspector requires to inspect the line for leaks. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any isolated section thereof, to maintain the specified leakage test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.
- D. The inspector will record the amount of water supplied to the pipeline at the end of the first hour of the test and at each hour thereafter for the full duration of the test. Should the amount of leakage (ie water supplied to the pipe) recorded for any hour exceed the amount recorded for any previous hour, even if the amount of leakage is less than the allowable amount, the test shall continue for additional one-hour periods until the leakage stabilizes or decreases.
- E. The maximum allowable leakage for ductile iron mains shall be determined by the following formula from the ANSI/AWWA Standard C600-05 "Installation of Ductile-Iron Water Mains and Their Appurtenances", latest edition:

$$L = \frac{SD \text{ times the square root of } P}{148,000}$$

where: L is the allowable leakage in gallons per hour; S is the length of pipeline tested in feet; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test, in pounds per square inch gage.

Note: For force mains, also see "Tightness Standards" in Section UC-370, as applicable.

- E. No pipe installation will be accepted if the leakage is greater than that determined by the above requirements.
- F. The Contractor shall locate and repair all leaks until the leakage is reduced to the limits specified. The Contractor may use the leak detector belonging to the MD-WASD but shall reimburse the MD-WASD for the actual cost of the operation of the instrument by MD-WASD personnel. Any observed leaks or any obviously defective joints or pipes shall be repaired or replaced as directed by the MD-WASD, even though the total leakage is below that specified above. The tests and repairs shall be continued or repeated until the Engineer is assured that the leakage from the section of line under test is less than the amount specified.

END OF SECTION