SECTION 33 31 26 – TESTING WATER DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for testing piping in water distribution systems.

1.2 SUBMITTALS

A. Submittals shall be made as required in Section 01 33 00, SUBMITTALS. The following specific information shall be provided:

1. Quality Control Submittals:

a. Testing Plan: Submit at least 30 days prior to testing and include at least the information that follows.

1) Testing dates.
2) Piping systems and sections(s) to be tested.
3) Test type.
4) Method of isolation.
5) Calculation of maximum allowable leakage for piping sections(s) to be tested.

b. Certifications of Calibration: Testing equipment.
Certified Test Report.

PART 2 - PRODUCTS

A. NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

A. Notify Engineer in writing 5 days in advance of testing. Perform testing in presence of Engineer.

B. Pressure Piping:

1. Install temporary thrust blocking or other restraint as necessary to protect adjacent piping or equipment and make taps in piping prior to testing.
2. Wait 5 days minimum after concrete thrust blocking is installed to perform pressure tests. If high-early strength cement is used for thrust blocking, wait may be reduced to 2 days.
3. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
4. New Piping connected to Existing Piping:

a. Isolate new piping with grooved-end pipe caps, spectacle blinds, blind flanges, or as acceptable to Engineer.

b. Test joint between new piping and existing piping by methods that do not place entire existing system under test load, as approved by Engineer.

5. Items that do not require testing include: Equipment seal drains, tank overflows to atmospheric vented drains, and tank atmospheric vents.
6. Test Pressure: As indicated on the Piping Schedule.

C. Test section may be filled with water and allowed to stand under low pressure prior to testing.

3.2 HYDROSTATIC TEST FOR PRESSURE PIPING

A. Test piping as indicated in pipe schedule.

B. Fluid: Clean water of such quality to prevent corrosion of materials in piping system.

C. Test pressure shall be the lesser of 150 psi or the maximum pressure of all components in the system.

D. All piping shall be tested in accordance with AWWA C600, latest revision.

E. All tests shall be performed by the contractor in the presence of a City Inspector and the Engineer of Record.

F. Contractor shall provide all equipment required to perform tests. Including but not limited to, gauges, meters, and pumps. The contractor shall also make all taps and connections required to perform testing.

G. Exposed Piping:

1. Perform testing on installed piping prior to application of insulation.
2. Maximum Filling Velocity: 0.25 feet per second, applied over full area of pipe.
3. Vent piping during filling: Open vents at high points of piping system or loosen flanges, using at least four bolts, or use equipment vents to purge air pockets.
4. Maintain hydrostatic test pressure continuously for 60 minutes, minimum, and for such additional time as necessary to conduct examinations for leakage.
5. Examine joints and connections for leakage.
6. Correct visible leakage and retest as specified.
7. Empty pipe of water prior to final cleaning.

H. Buried Piping:

1. Test after backfilling has been completed.
2. Flush piping and expel air from piping system during filling.
3. Apply and maintain specified test pressure with hydraulic force pump. Valve off piping system when test pressure is reached.
4. Maintain hydrostatic test pressure continuously for 2 hours minimum, if the test pressure falls more than 5 psi within the 2 hour period the test will be terminated and considered a failure due to assumed leaks.
5. Determine actual leakage at the end of the 2 hour test period by restoring the pressure to the initial test pressure and measuring the quantity of water necessary to restore pressure to the initial test pressure.
6. Maximum Allowable Leakage:

$$L = \frac{S\,D\,\sqrt{P}}{148{,}000}$$

Where:

L = Allowable leakage, in gallons per hour.
S = Length of pipe tested, in feet.
D = Nominal diameter of pipe, in inches.
P = Test pressure during leakage test, in pounds per square inch.

Correct leakage greater than allowable, and retest as specified.

3.3 PRESSURE TEST FOR TAPPING SLEEVES

A. The contractor shall provide pumps and all other equipment necessary to test the tapping sleeves. Tapping sleeves shall be tested prior to making any taps. The duration of the hydrostatic test shall be thirty (30) minutes at 225 psi with zero leakage.

3.4 FIELD QUALITY CONTROL

A. Test Report Documentation:

1. Test date.
2. Description and identification of piping tested.
3. Test fluid.
4. Test pressure.
5. Test start/stop times.
6. Calculated leakage
7. Remarks, including:
    a. Leaks (type, location).
    b. Repair/replacement performed to remedy excessive leakage.
8. Signed by Contractor and Engineer to represent that test has been satisfactorily completed.

PART 4 - MEASUREMENT AND PAYMENT

4.1 No separate payment will be made for testing water distribution systems.

- END OF SECTION -