

METROPOLITAN UTILITIES DISTRICT

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Page: 1 of 3
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CONSTRUCTION STANDARD FOR: PRESSURE TESTING WATER MAINS

Supersedes: New

I. GENERAL

Only trained personnel shall be in charge of Pressure Testing new and old water mains.

The water supply shall be available to the "Chlorine Truck" either through a chlorine tube or hydrant within 150' of the inlet used for filling the main to be pressure tested.

All connections to existing mains shall be separated through the use of a chlorine tube. Pressure testing shall not be done against a closed valve.

All air taps shall be installed prior to the pressure testing process.

II. PRESSURE AND LEAKAGE TESTING NON-POLYETHYLENE MAINS (Ductile Iron, PVC, Steel, & Concrete)

A. **General** – Mains will be subjected to a combined pressure and leakage test. For ease of testing, the main may be divided into sections as shown on the drawings.

B. **Test Procedure**

1. Flow water slowly into the main or section to be tested while air is allowed to escape through air reliefs.
2. After the main is filled and all air is released, close all the air reliefs.
3. The main shall be tested at 180 psi at the lowest point in the test section.

The following formula shall be used to correct for the elevation difference between the low point of the section being tested and the location of the testing truck:

$$\text{Test Pressure} = 180 \text{ (psi)} - \frac{\text{Elevation Difference (ft.)}}{2.31 \text{ (ft./psi)}}$$

Gradually pressurize the test section to 180 psi at the lowest point of the test section and maintain that pressure for one (1) hour. Add make-up water as required to maintain test pressure. Monitor and record the make-up water.

4. Use Table 1 to calculate the maximum allowable volume of make-up water. The maximum allowable volume of make-up water for the test section is the sum of the make-up volumes calculated for each pipe size in the section, based on length. If the volume of make-up water used during the test is less than the maximum allowable volume of make-up water, the section passed pressure test.

Table 1
Maximum Allowable Make-up Volume

Main Size (Inches)	Make-up Volume for PVC Water Mains (gal/1000 feet)	Make-up Volume for D.I., Steel, and Concrete Water Mains (gal/1000 feet)
6	0.54	0.54
8	0.73	0.73
10	0.91	0.91
12	1.09	1.09
14	1.27	1.27
16	1.45	1.45
24	2.18	2.18
30	2.72	2.72
36	3.26	3.26
42	NA	3.81
48	NA	4.35
54	NA	4.90

III. PRESSURE AND LEAKAGE TESTING OF HDPE WATER MAINS

A. General – Mains will be subjected to a combined pressure and leakage test.

B. Test Procedure – The test shall be conducted in three phases as follows:

1. Filling Phase

Flow water slowly into the main or section to be tested while air is allowed to escape through air reliefs. After the main is filled and all air is released, close all air reliefs.

2. Expansion Phase

The main shall be tested at 180 psi at the lowest point in the test section.

The following formula shall be used to correct for the elevation difference between the low point of the section being tested and the location of the testing truck:

$$\text{Test Pressure} = 180 \text{ psi} - \frac{\text{elevation difference (ft)}}{2.31 \text{ (ft/psi)}}$$

Gradually pressurize the test section to 180 psi at the lowest point of the test section, and maintain that pressure for three (3) hours. **NOTE:** *HDPE pipe expands slightly under pressure. Add make-up water as required to maintain test pressure. It is not necessary to monitor the amount of water utilized during the Expansion Phase.*

**CONSTRUCTION STANDARD FOR: PRESSURE TESTING
WATER MAINS**

Supersedes: New

3. Test Phase

At the end of the three (3) hour Expansion Phase, maintain 180 psi test pressure at the lowest point of the section for one (1) more hour. Monitor and record the amount of make-up water that is used to maintain test pressure during this one (1) hour test period. Use Table 2 to calculate the maximum allowable volume of make-up water. The maximum allowable volume of make-up water for the test section is the sum of the make-up volumes calculated for each pipe size in the section, based on length. If the volume of make-up water used during the test is less than the maximum allowable volume of make-up water, the section passed pressure test.

Table 2
Maximum Allowable Make-up Volume (Per Plastic Pipe Institute 1999)

<u>Main Size (Inches)</u>	<u>Make-up Volume (gal/100 feet of pipe)</u>
6	0.3
8	0.5
10	0.8
12	1.1
14	1.4
16	1.7
18	2.0
20	2.8
24	4.5
30	6.3
32	7.0
36	9.0
42	12.0
48	15.0
54	18.5

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