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Effective: 3-9-22		
Prepared by: D.J. Satterfield		
Approved by: Jeff Schovanec		

GENERAL

* Only trained personnel shall supervise pressure testing water mains.

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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 unless approved by Engineering Design and the Director of Water Distribution.

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

* PRESSURE AND LEAKAGE TESTING FOR DUCTILE IRON, PVC, STEEL & CONCRETE

* **A. General** – Ductile iron, PVC, steel & concrete 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.

* Revised Text

** Deleted Text



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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

PRESSURE AND LEAKAGE TESTING OF HDPE WATER MAINS

- * **A. General** – HDPE mains will be subjected to a combined pressure and leakage test in general accordance with ASTM F2164 and this construction standard.
- 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.

* Revised Text



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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 four (4) 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.*

3. Test Phase

- * At the end of the four (4) hour Expansion Phase, reduce pressure by 10psi (to 170 psi at the lowest point) and monitor for one (1) hour. Do not increase pressure or add make-up water. If no visual leakage is observed and the pressure remains within 5% of the target test pressure (>161.5 psi at the lowest point) for one (1) hour, passing test is indicted.

*** PRESSURE AND LEAKAGE TESTING OF STRUCTURALLY LINED MAINS

A. General – Linings will be subjected to a combined pressure and leakage test in general accordance with ASTM F1216 and this construction standard.

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 released, close all 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 add makeup water as needed to hold this pressure for a period of three hours (3) to allow for stabilization of the liner. It is not necessary to monitor the amount of water utilized during this time.

- * Revised Text 
- *** New Section

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At the end of the three-hour stabilization period, begin monitoring and recording the amount of make-up water added to maintain test pressure for one (1) additional hour.

- Use Table 2 to calculate the maximum allowable volume of make-up water allowed during the monitoring period. –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 ASTM-F1216)

Main Size (Inches)	Make-up Volume (gal/1000 feet of pipe)
6	0.95
8	1.26
10	1.58
12	1.89
14	2.21
16	2.53
18	2.84
20	3.16
24	3.79
30	4.73

*** New Section



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