

SECTION 02515

HYDROSTATIC TESTING OF PIPELINES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Field hydrostatic testing of newly installed water pipelines.

1.02 MEASUREMENT AND PAYMENT

A. Unit Prices.

1. No payment will be made for hydrostatic testing of pipelines under this Section. Include cost in unit price of pipelines being tested.

2. Refer to Section 01270 - Measurement and Payment for unit price procedures.

B. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for work in this Section is included in total Stipulated Price.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.01 PREPARATION

A. Disinfect water system pipelines prior to hydrostatic testing.

B. Hydrostatically test newly installed water pipelines after disinfection, when required, and before connecting to the City water distribution system.

C. Water for testing will be provided to Contractor at no charge. Prior to hydrostatic testing, obtain a transient meter from the City. Deposit is required for transient meter.

D. Test pipelines in lengths between valves, or plugs, of not more than 2,000-ft. unless approved by Public Works.

E. Conduct hydrostatic tests in presence of Public Works.

3.02 TEST PROCEDURES

A. Furnish, install, and operate connections, pump, meter and gages necessary for hydrostatic testing.

- B. Allow pipeline to sit minimum of 24 hours from time it is initially disinfected until testing begins, to allow pipe wall or lining material to absorb water. Periods of up to 7 days may be required for mortar lining to become saturated.
- C. For all water lines, expel air and apply minimum test pressure of 200 psi. During the test, pressures shall not vary more than  $\pm 5$  psi.
- D. Begin test by 9:00 a.m. unless otherwise approved by Public Works. Maintain test pressure for typically 4 hours, a minimum 2 hours if approved by Public Works. When large quantity of water is required to maintain pressure during test, discontinue testing until cause of water loss is identified and corrected.
- E. Keep valves inside pressure reducing stations closed during hydrostatic pressure test.

### 3.03 ALLOWABLE LEAKAGE FOR WATERLINES

- A. During hydrostatic tests, no leakage will be allowed for sections of water lines consisting of welded joints.
- B. Maximum allowable leakage for water lines with rubber gasketed joints will be according to AWWA 600 for 200 psi:

$$\text{Max Allowable Leakage Rate (gal/hr)} = (L \times D \times \sqrt{P}) / 148,000$$

where L is length of test section in feet, and D is nominal diameter in inches, P is test pressure (psi)

- C. For meter run installation, when work cannot be isolated and line fails pressure test, visual inspection of work by Public Works for leakage during pressure test may be used to fulfill requirements of this section.

### 3.04 CORRECTION FOR FAILED TESTS

- A. Repair joints showing visible leaks on surface regardless of total leakage shown on test. Check valves and fittings to ensure that no leakage occurs that could affect or invalidate test. Remove cracked or defective pipes, fittings, and valves discovered during pressure test and replace with new items.
- B. Public Works may require failed lines to be disinfected after repair and prior to retesting. Conduct and pay for subsequent disinfection operations in accordance with requirements of Section 02514 - Disinfection of Water Lines. Pay for water required for additional disinfection and retesting.

- C. Repeat test until satisfactory results are obtained.

### 3.05 COMPLETION

- A. Upon satisfactory completion of testing, remove risers remaining from disinfection and hydrostatic testing, and backfill excavation promptly.

### END OF SECTION

**Table 1 Maximum allowed leakage rate (gal/hr) for hydrostatic testing at 200 psi.**

| Pipe Dia.<br>in | Pipe Length, feet |      |      |      |      |      |      |      |      |      |      |
|-----------------|-------------------|------|------|------|------|------|------|------|------|------|------|
|                 | 100               | 200  | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 2000 |
| 6               | 0.06              | 0.11 | 0.17 | 0.23 | 0.29 | 0.34 | 0.4  | 0.46 | 0.52 | 0.57 | 1.15 |
| 8               | 0.08              | 0.15 | 0.23 | 0.31 | 0.38 | 0.46 | 0.54 | 0.61 | 0.69 | 0.76 | 1.53 |
| 10              | 0.1               | 0.19 | 0.29 | 0.38 | 0.48 | 0.57 | 0.67 | 0.76 | 0.86 | 0.96 | 1.91 |
| 12              | 0.11              | 0.23 | 0.34 | 0.46 | 0.57 | 0.69 | 0.8  | 0.92 | 1.03 | 1.15 | 2.29 |
| 14              | 0.13              | 0.27 | 0.4  | 0.54 | 0.67 | 0.8  | 0.94 | 1.07 | 1.2  | 1.34 | 2.68 |
| 16              | 0.15              | 0.31 | 0.46 | 0.61 | 0.76 | 0.92 | 1.07 | 1.22 | 1.38 | 1.53 | 3.06 |
| 18              | 0.17              | 0.34 | 0.52 | 0.69 | 0.86 | 1.03 | 1.2  | 1.38 | 1.55 | 1.72 | 3.44 |
| 20              | 0.19              | 0.38 | 0.57 | 0.76 | 0.96 | 1.15 | 1.34 | 1.53 | 1.72 | 1.91 | 3.82 |
| 24              | 0.23              | 0.46 | 0.69 | 0.92 | 1.15 | 1.38 | 1.61 | 1.83 | 2.06 | 2.29 | 4.59 |
| 30              | 0.29              | 0.57 | 0.86 | 1.15 | 1.43 | 1.72 | 2.01 | 2.29 | 2.58 | 2.87 | 5.73 |
| 36              | 0.34              | 0.69 | 1.03 | 1.38 | 1.72 | 2.06 | 2.41 | 2.75 | 3.1  | 3.44 | 6.88 |
| 42              | 0.4               | 0.8  | 1.2  | 1.61 | 2.01 | 2.41 | 2.81 | 3.21 | 3.61 | 4.01 | 8.03 |