

08-07

**ROGERS WATER UTILITIES WATER SYSTEM  
ROGERS, ARKANSAS**

**SPECIFICATIONS FOR WATER MAINS  
HYDROSTATIC TEST  
REVISED APRIL 2006**

1. **SCOPE**

This specification governs the testing of water mains and fire lines by the hydrostatic test method.

2. **GENERAL REQUIREMENTS**

- a. Water main(s) shall be hydrostatic tested for leaks upon the completion of the backfill/compaction operation and the curb/gutter for residential subdivision and multifamily construction.
- b. The hydrostatic test method shall be in accordance with ANSI/AWWA C600-99 for ductile iron main(s), except as specified otherwise herein.
- c. All pipelines, services, fire hydrants, air release valves and appurtenances shall be hydrostatic tested.
- d. RWU personnel must operate the water main valve(s) connected to the existing water system. The Contractor shall operate all other water main valve(s) and fire hydrant(s) within the pipe network being hydrostatic tested. All valve(s) within the pipe network being hydrostatic tested shall be in the open position.
- e. All water main(s) shall be given a hydrostatic test of at least 1.5 times water system operating pressure or 150 pounds per square inch (psi), which ever is greater. The pressure measurement shall be made from the lowest elevation of the water main section being tested. The test pressure shall not exceed the pipe or valve rated pressures.
- f. Fire line(s) shall be given a hydrostatic test of at least 200 pounds per square inch (psi).
- g. The hydrostatic test duration of each water main/fire line test section is 2 hours (uninterrupted).

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- h. The maximum allowable leakage of water main(s) and/or fire line(s) shall be based upon the following formula:

Ductile Iron Pipe

$$L = \frac{SDP^{1/2}}{133,200}$$

Where:

L = Allowable leakage (makeup water) in gallons per hour (GPH)

S = Length of pipe tested in feet

D = Nominal diameter of pipe in inches

P = Average test pressure maintained during leakage test in psi

- i. All fire hydrants shall be bagged with black plastic bags until the connected water main(s) has passed the disinfection test.
- j. The Contractor shall furnish all equipment and labor required, including necessary piping/hoses, injection booster pump, test pressure gauge, water source for testing the water main(s) with a measuring meter and stopwatch. The measuring meter dial shall be in 0.10 gallons increments. The test pressure gauge shall have a minimum range of 0-300 psi and the pressure gauge figure intervals shall be a maximum of 5 psi increments.
- k. The Contractor shall install a test corporation at the location determined by the Engineer and RWU personnel. The Contractor shall be responsible for any holes excavated and/or left open for hydrostatic testing purposes.
- l. The hydrostatic test shall be performed by the Contractor and witnessed by the Engineer and RWU personnel. The Engineer shall furnish hydrostatic test reports of water main(s) to the Contractor and RWU.
- m. The cost of the hydrostatic test including test and air release corporations, filling water and bagging and unbagging fire hydrants is incidental to the cost of the project.
3. **TEST PROCEDURES**
- a. RWU personnel will open the water main valve that is connected to the existing water system while the Contractor manipulates the water main valve(s) and fire hydrant(s) to slowly fill the water main and remove/expel all air from the section of water main being tested. If permanent air release valves are not located at all

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- points of the water main(s), corporation taps shall be made by the Contractor and afterwards tightly plug as required on test corporation(s).
- b. After the section of water main being tested has been filled with water, the section of water main being tested shall be allowed to stand under static pressure for 24 hours prior to hydrostatic testing.
  - c. The Contractor shall hydrostatic test (pre-test) the test section at the specified test pressure. The pre-test shall continue until the Contractor has satisfied himself that the test section will pass the hydrostatic test.
  - d. Once the test section has been pre-tested, the specified test pressure shall be supplied by means of the injection booster pump and the Engineer must record the initial pressure reading. After the 2 hour test period, the Engineer must record the ending pressure reading. RWU personnel must witness the pressure readings.
  - e. After the 2 hour test period, the computed allowable leakage volume (measured by the test water meter) must be injected into the water main test section by means of the injection booster pump. After the allowable leakage volume is added into the water main test section, the Engineer must record the final pressure reading. If the final pressure reading is less than the initial pressure reading, the water main test section has *failed the hydrostatic test*. If the final pressure reading is equal too or greater than the initial pressure reading, the water main test section has *passed the hydrostatic test*. RWU personnel must witness the pressure readings and leakage volume added.

5. **FAILURE OF HYDROSTATIC TEST**

Any water main that has visible leaks or fails the hydrostatic test must be repaired. Upon completion of the repairs and the backfill/compaction operation, the water main shall be retested as described in the above test procedures. The Engineer must witness the water main repair and backfill operation. The cost of the repair and backfill is incidental to the cost of the project.

6. **ACCEPTANCE**

The water main shall have passed the hydrostatic test if the water main test section does not exceed the allowable leakage after the 2 hour test period.

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**ALLOWABLE LEAKAGE OF DIP WATER MAINS IN GALLONS PER HOUR (GPH) AT 150 PSI**

Pipe Dia. (In.)	100 Ft.	200 Ft.	300 Ft.	400 Ft.	500 Ft.	600 Ft.	700 Ft.	800 Ft.	900 Ft.	1000 Ft.
8	0.07	0.15	0.22	0.29	0.37	0.44	0.51	0.59	0.66	0.74
12	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.10
18	0.17	0.33	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.65
24	0.22	0.44	0.66	0.88	1.10	1.32	1.54	1.76	1.99	2.21

If water main under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each pipe size.

**ALLOWABLE LEAKAGE OF DIP WATER MAINS & FIRE LINES IN GALLONS PER HOUR (GPH) AT 200 PSI**

Pipe Dia. (In.)	100 Ft.	200 Ft.	300 Ft.	400 Ft.	500 Ft.	600 Ft.	700 Ft.	800 Ft.	900 Ft.	1000 Ft.
6	0.06	0.13	0.19	0.25	0.32	0.38	0.44	0.51	0.57	0.64
8	0.08	0.17	0.25	0.34	0.42	0.51	0.59	0.68	0.76	0.85
12	0.13	0.25	0.38	0.51	0.64	0.76	0.89	1.02	1.15	1.27
18	0.19	0.38	0.57	0.76	0.96	1.15	1.34	1.53	1.72	1.91
24	0.25	0.51	0.76	1.02	1.27	1.53	1.78	2.04	2.29	2.55

If water main under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each pipe size.

**Previous Specifications**

April 16,1997