ITEM 939

HYDROSTATIC TEST OF PRESSURE LINES

939.1 General: After pipe (waterline, sanitary sewer force main, or other types of pressure line) have been laid and backfilled, but prior to replacement of permanent surface, subject newly laid pipeline to hydrostatic pressure test. Test pressure for particular types of service as indicated below:

A. Force Main: 70 pounds per square inch as measured at high point in system.

B. Water Main: 125 pounds per square inch as measured at high point in system.

939.2 Duration of Pressure Test: Six hours where joints are covered, and not less than two hours where joints are exposed. If leakage at end of six hours or two hours (as applicable) is between 75 and 100 percent of allowable, test shall continue for not less than 18 additional hours.

939.3 Procedures: Fill each valved section of pipe slowly with water and apply test pressure specified hereinabove or test pressure as set forth in preceding Special Provision, by means of pump connected to pipe. Demonstrate that any intermediate valves on section being tested are fully opened. Test pump must maintain test pressure at all times. Provide pressure-regulating valve with bypass return to test water storage reservoir so that applicable test pressure is always maintained in the section being tested. Furnish pump, pipe connection, plugs, and necessary apparatus including gauges, meters, and all required accessories for conducting tests. Provide all labor and incidentals as needed to perform hydrostatic test. Perform test in presence of OWNER'S authorized representative.

939.4 Expelling Air Before Test: Before applying specified test pressure, expel air from line. To accomplish this, make taps in pipe, if necessary, at points of highest elevation, and after testing is satisfactorily completed, plug taps with brass plugs.

939.5 Examination Under Pressure: At intervals during test, inspect route of line to locate any leaks or breaks. Remove and replace defective joints, cracked or defective valves, pipe, or fittings. Use of repair clamps on newly laid pipe is prohibited.

939.6 Leakage Defined: Leakage is defined as quantity of water supplied into newly laid pipe, or any valved section of it, necessary to maintain specified leakage test pressure after pipe has been filled with water and air expelled. Leakage will be determined from readings of water meter installed on discharge side of test pump, and/or as measured by withdrawal from test water storage reservoir.

939.7 Permissible Leakage: Pipe lines, when tested under applicable pressure, shall not exceed that shown on the following tables:

PVC (AWWA C900) or ASTM D2241, (DR26)
Maximum Allowable Leakage
Gallons per Hour per 1,000 Ft. of Main

Pipe Size (In.)	Force Main (70 psi)	Water Main (125 psi)
4	0.23	0.30
6	0.34	0.45
8	0.45	0.60
10	0.57	0.76
12	0.68	0.91

Gray Iron (AWWA C106) Ductile Iron (AWWA C151)
Maximum Allowable Leakage
Gallons per Hour per 1,000 Ft. of Main

Pipe Size (In.)	Force Main (70 psi)	Water Main (125 psi)
4	0.25	0.34
6	0.38	0.50
8	0.50	0.67
10	0.63	0.84
12	0.78	1.01
14	0.88	1.18
16	1.00	1.34
18	1.13	1.51
20	1.26	1.68
24	1.51	2.01

939.8 Variation from Permissible Leakage: Should any test of sections of pipe disclose leakage in excess of allowable quantity, locate and repair defects and retest until tests prove that leakage is within specified allowance.

939.9 Measurement and Payment: No separate measurement and payment for work performed under this Item. Include cost of this work in Contract price bid for Bid Items of which it is a component.

END OF ITEM 939