

ITEM 477

LOW PRESSURE AIR TEST - SANITARY SEWER LINES

477.1 Description. This item shall govern for furnishing all labor, materials, tools and equipment and for performing low pressure air testing on completed sanitary sewer lines.

After the gravity sanitary sewer line has been laid and backfilled, but prior to replacement of pavement, the sanitary sewer line shall be subjected to a low pressure air test. Test shall be performed using equipment denoted herein and according to the outlined procedures.

The contractor shall take such precautions as required to prevent damage to the lines and appurtenances being tested. Damage resulting from any testing shall be repaired at the Contractor's expense. All testing shall be completed in the presence of the Engineer.

477.2 Equipment. The equipment used shall meet the following requirements:

- A. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe being tested.
- B. Pneumatic plugs shall resist the internal test pressures without requiring external bracing or blocking.
- C. One of the pneumatic plugs shall have an inlet tap or other provision for connecting air supply to introduce low pressure air into the line for testing.
- D. All air used shall pass through a single control panel.
- E. Air supply system shall have the necessary valves and gauges to control the rate at which air enters the test section and for reading test results.
- F. Pressure gauges shall have minimum gradations of 0.1 psi and an accuracy of plus or minus 0.04 psi.

477.3 Pretesting Procedures. In an area where groundwater is known to exist, prior to conducting any tests, the Contractor shall provide for determining groundwater level by installing groundwater gauges in the manholes.

Gauges shall consist of a minimum 1/2 inch diameter pipe, capped and inserted horizontally in the manhole wall as near as possible to the top of the sewer, sealed so as to be watertight. Immediately prior to the performance of the test, groundwater back pressure shall be determined by removing pipe cap, blowing air through the pipe into the ground to clean the pipe. Clear plastic tube shall be held vertically and

measurement of height (in feet) of water over invert of pipe to be taken after water has stopped rising.

Height shall be divided by 2.3 feet to establish pounds per square inch (psi) of back pressure to be added to all readings. Upon satisfactory completion of the air test, remove the groundwater gauge from the wall of manhole and neatly and permanently close opening with a non-shrinking, non-corrosive grout. Prior to testing flush and clean sewer lines of any debris, also, plug all pipe outlets to resist test pressure.

477.4 Testing Procedures. The testing procedure shall be as follows:

- A. Seal-test all pneumatic plugs before using in the test installation. Lay one length of pipe on the ground and seal at both ends with the pneumatic plug. Introduce air into the pneumatic plug to 24 psig. Sealed pipe to be pressurized to 5 psig. Plugs shall hold against this pressure without external bracing.
- B. Contractor shall carefully observe safety precautions during air testing; no one shall be allowed in the manholes during testing.
- C. Place pneumatic plugs in the line at each manhole and inflate to 25 psig. Introduce low pressure air into sealed line until internal air pressure reaches a pressure of 4 psig plus the average groundwater back pressure. Allow two minutes for the internal air pressure to stabilize.
- D. When the internal air pressure has stabilized and is at or above test pressure (3.5 psig minimum, plus groundwater back pressure), commence the test. Disconnect air hose from the control panel to the air supply. Record the pressure drop for the test period.

If the pressure drops more than 1.0 psig during the test period, line is presumed to have failed. Test may be discontinued, when the prescribed test time has been reached.

The time required for the pressure to decrease from 3.5 psig to 2.5 psig (greater than the average groundwater back to pressure over the pipe) to be not less than the time shown for the diameter given in Table No. 1. Times shown are based on loss of air not to exceed 0.003 cubic feet per minute per square foot of internal pipe surface tested at an average pressure of 3.0 psi greater than the groundwater back pressure.

Table No. 1
Allowable Time Table

<u>Pipe Size</u> <u>(inches)</u>	<u>Time</u>		<u>Pipe Size</u> <u>(inches)</u>	<u>Time</u>	
	<u>Min.</u>	<u>Sec.</u>		<u>Min.</u>	<u>Sec.</u>
6	2	50	21	9	55
8	3	56	24	11	20
10	4	43	27	12	45
12	5	40	30	14	10
15	7	5	36	17	0
18	8	30	42	19	50

Sanitary sewers failing to meet the requirements of the low pressure air test shall be tested again after the Contractor has located and remedied defects causing this failure. No sanitary sewer shall be accepted until the requirements of the test procedure are satisfied.

The procedures for the low pressure air test must conform to the procedures described in ASTM C828, ASTM C924, ASTM F1417, or other appropriate procedures.

477.5 Measurement & Payment. No separate payment for work performed under this item. Include the cost in the contract unit price bid for the item of which this work is a component.

There are line code(s), description(s), and unit(s) for this item.

END OF ITEM 477