

shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at points of highest elevation and afterwards tightly plugged. Any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced by the CONTRACTOR with the sound material and the test shall be repeated until satisfactory to the ENGINEER. Provisions of AWWA C600 and C605, where applicable, shall apply.

#### 41-2.14C LEAKAGE TEST

(1) After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. Test pressure is defined as the maximum operating pressure of the section under test and is based on the elevation of the lowest point in the line or section under test corrected to the elevation of the test gauge. Applicable provisions of AWWA C600 and C605 shall apply. Duration of each leakage test shall be a minimum of two (2) hours in addition to the pressure test period.

(2) Allowable leakage in gallons per hour for pipe line shall not be greater than that determined by the formula:

In inch-pound units,

$$L = \frac{SD\sqrt{P}}{148,000}$$

Where:

L = testing (leakage) allowance (makeup water), in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of the pipe, in inches

P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

In metric units,

$$L_m = \frac{SD\sqrt{P}}{794,797}$$

Where:

L<sub>m</sub> = testing (leakage) allowance (makeup water), in liters per hour

S = length of pipe tested, in meters

D = nominal diameter of pipe, in mm.

P = average test pressure during the hydrostatic test, in kiloPascal (kPa) (gauge)

(3) Leakage is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under test, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. All visible leaks are to be repaired regardless of the allowance used for testing.

(4) Flanged pipe shall be "bottle tight".