

Kansas Administrative Regulations

Kansas Department of Agriculture—Division of Water Resources

Article 40.—Design of Earth Dams

5-40-16. Testing a principal spillway pipe installation in a dam; allowable leakage rate, test methods.

The allowable leakage rate for a principal spillway pipe installation in a dam shall not exceed 1,000 gallons per inch diameter of pipe per mile of pipe per day. The applicant shall use one of the following test methods in determining whether the allowable leakage rate has been exceeded:

(a) The applicant shall use the following test method procedure for a drop inlet structure if the starting and ending elevation of the water is within the vertical drop structure and above the top of the barrel:

(1) Calculate the allowable leakage rate in gallons per minute for the pipe being tested based on the following formula:

The allowable leakage rate in gallons per minute = $0.000132 \times d \times l$ where:

d = diameter of the tested pipe in inches

l = length of the tested pipe in feet

If the allowable leakage rate in gallons per minute is determined to be less than one, then it shall be assumed for the purposes of the test that the allowable leakage rate in gallons per minute is one.

(2) Conduct the test for 15 minutes.

(3) If the allowable leakage rate is one gallon per minute, the applicant may use the following table to determine the allowable drop in the elevation of the water in the riser.

Nominal diameter of riser (inches)	Allowable drop (feet)
18	1.13

20	0.83
24	0.64
30	0.41
36	0.28

(4) If the measured drop in the riser exceeds the corresponding allowable drop in paragraph (a)(1) above, the allowable leakage rate has been exceeded, which shall not be acceptable. If the measured drop in the riser is less than or equal to the corresponding allowable drop in paragraph (a)(1) above, the allowable leakage rate has not been exceeded and shall be acceptable.

(b) The applicant shall use the following test method procedure for all other types of installations, including canopy inlets:

(1) If filling the pipe with water up to an elevation of 10 feet above the outlet puts water within the vertical riser below the top of the barrel, the elevation shall be reduced below the bottom of the vertical riser before the test begins.

(2) The allowable drop in elevation is a function of the allowable leakage rate, test duration, and the diameter and slope of the pipe. The allowable drop in the pipe in feet shall be calculated by use of the following formula:

$$\frac{\text{allowable rate (gallons per minute)} \times \text{test duration (minutes)} \times \text{slope (\%)}}{[\text{diameter (inches)}]^2 \times 4.08}$$

(3) The minimum test duration shall be 15 minutes. If the above formula results in an allowable drop of less than 0.1 foot in 15 minutes, the test duration shall be extended so that the allowable drop is greater than 0.1 feet.

(4) The water surface elevation drop shall be measured by means of a clear plastic tube installed in the plug at the downstream end of the principal spillway pipe. Any other means of measuring the drop in elevation shall be approved by the chief engineer in advance of the test.

(5) If the measured drop is greater than the allowable drop as calculated in paragraph (b)(2), the allowable leakage rate has been exceeded, which shall not be acceptable. If

the allowable drop is less than or equal to the allowable drop as calculated in paragraph (b)(2), the allowable leakage rate has not been exceeded, which shall be acceptable. (Authorized by K.S.A. 82a-303a; implementing K.S.A. 82a-303b; effective Sept. 22, 2000.)

***** Authenticated Kansas Administrative Regulation *****