

#### 4.2.6 **Fire Hydrant Maintenance and Testing**

- 4.2.6.1 Maintenance and testing. The utility shall have a hydrant maintenance and fire flow testing program. Testing and maintenance shall comply with the requirements of AWWA Manual M17, *Installation, Field Testing, and Maintenance of Fire Hydrants*. This program shall include as a minimum the following elements:
1. A goal for the number of hydrants to be inspected and tested based on a percentage of the total hydrants in the system.
  2. Procedures for opening and closing hydrants to minimize potential damage to the distribution system.
  3. Fire flow-testing requirements.

#### **Rationale**

Providing adequate fire protection is a major element of any water utility's function. One major component of this element is the fire hydrant and its maintenance. Periodic testing and maintenance is required to ensure proper operation when needed during emergency conditions.

All hydrants should be inspected regularly, at least once a year, to ensure their satisfactory operation, and those needing repairs should be properly tagged and the fire department informed. It is essential that all repairs are documented, which means that each hydrant should have its own unique identifier for record-keeping purposes.

Fire flow tests are conducted to determine pressure and flow-producing capabilities at any location within the distribution system. The primary function of fire flow tests is to determine how much water is available for fighting fires, but the tests also serve as a means of determining the general condition of the distribution system. Flow tests can help detect closed valves as well as heavily tuberculated mains and are used extensively by insurance underwriters as a factor in setting rates for insurance premiums.

#### **Example of Methods or Procedures**

Fire flow testing follows the initial procedures of a flushing program, with the proper notifications and work preparation. The following procedures are for the testing steps.

1. Screw a pressure gauge setup on one 2½-in. outlet of the upstream static hydrant (hydrant closest to a transmission main or a larger-diameter main).
2. Fully open the static hydrant, bleeding the air through the petcock valve of the setup.
3. Observe the static pressure at the static hydrant, recording the pressure two or three times at 30-second intervals to ensure average pressures are obtained.
4. Record all information relevant to the test on the appropriate worksheet.
5. Place appropriate signs (“water on road,” “flooded area,” etc.) on either side of the flow hydrant site(s).
6. Contact dispatch to inform them of the work being done and what hydrants are affected.
7. Screw either a diffuser on each 2½-in. outlet of the flow hydrant, or use one 4½-in. diffuser. If the static pressure is remaining stable, the person at the static hydrant will call or signal the personnel at the flow hydrant(s) to begin the test.
8. Open the flow hydrant and flushing valve fully, and bleed off the air from the pitot by opening the petcock valve.
9. Measure the flow from the diffuser at the flow hydrant(s). Make sure the water is flowing unobstructed into a catch basin, ditches, etc., and remove obstacles as necessary. NOTE: During freezing temperatures, ensure all flowing water remains out of the roadway.
10. When flowing the 2½-in. nozzle(s), use the information in Table 4.2.4-1 to convert psi to gpm (gallons per minute). When flowing the 4½-in. nozzle, use Table 4.2.4-2 to convert psi to gpm. Tables are located at the end of Sec. 4.2.4.
11. When the residual pressure reading has stabilized, the person at the static hydrant will call the personnel at the flow hydrant(s) to ensure flow hydrant(s) are fully open, and to tell them to take the pitot reading. DO NOT allow the residual pressure to fall below 20 psi (138 kPa) during the test, per State Primary Drinking Water Regulations, R.61-58.5(D).
12. Confirm that an adequate pressure drop has been obtained at the static hydrant (a minimum pressure drop of 10 psi [69 kPa] is needed to accurately calculate the Q20-value).

13. In the event the pressure drops were too small using one flow hydrant, be prepared to flow an additional hydrant. This situation may occur on large distribution mains and transmission mains.
14. Close the hydrants slowly to minimize any water hammering.

### **Questions to Check Progress**

1. Does the utility have implemented and documented policies and procedures to exercise all fire hydrants in an exercising program that is comprehensive, integrated, and preventive on a systemwide basis?
2. Does the utility have implemented and documented goals to exercise the number of fire hydrants in the distribution system on an annual basis and identify the deficient fire hydrants and address these deficiencies in a timely manner?
3. Does the utility have policies and procedures to initiate corrective action if the annual goals of fire hydrant exercising or repair or replacement in a prescribed timely manner are not met?
4. Does the utility identify all the critical fire hydrants in the distribution system and regularly exercise them on a frequency greater than other fire hydrants?
5. Does the utility collect routine fire flow data?
6. Does the utility closely work with the local fire departments and inform them of the status of all fire hydrants in terms of operational status functionality and locations?
7. Does the utility have implemented and written procedures to address all above scenarios that are based on AWWA Manual M17?



# MERCER COUNTY FIRE PROTECTION DISTRICT FIRE HYDRANT INSPECTION FORM



Hydrant Number	Station District	Water District
Hydrant Location		
GPS Location, If Available		
Hydrant Manufacturer	Number of Large Diameter Discharges	Number of 2 1/2" Discharges

Hydrant is readily accessible for water supply	Satisfactory	Not Satisfactory
Hydrant is upright, not bent or deformed	Yes	No
Large diameter discharge is accessible	Satisfactory	Not Satisfactory
2 1/2" discharges are accessible	Satisfactory	Not Satisfactory
All caps are present	Yes	No
Caps are only hand tight	Satisfactory	Not Satisfactory
Hydrant valve is in the "on" position	Yes	No
Hydrant opens properly when turned from stem	Yes	No
Water leaks from top of hydrant	Yes	No
Water leaks from caps	Yes	No
Nozzle threads are not damaged	Satisfactory	Not Satisfactory
Threads lubricated with lithium grease this date	Yes	No
Hydrant closes properly from stem	Yes	No
Hydrant drains properly	Yes	No
Static pressure on hydrant	psi	
Flow pressure using pitot gauge using 2 1/2" discharge	psi	
Measured flow (GPM)	gpm	

Comments (Obstacles, Fencing, Safety Considerations)

Firefighter Name	Unit Number	Date of Inspection
------------------	-------------	--------------------