

Sweetwater Authority Fire Hydrant Maintenance Program Standards and Procedures

Introduction

Fire hydrants constitute a critical component providing fire protection for the City of National City, Chula Vista and the County of San Diego. In case of emergencies fire hydrants must be safely and easily accessible, functional and capable of delivering required fire flow at all times. Fire hydrant auxiliary valves must be visible and capable of properly isolating the fire hydrant in case the fire hydrant is broken off. More detailed auxiliary valve maintenance standards and procedures can be found in the Sweetwater Authority Valve Maintenance Program. This maintenance program is intended to be proactive and productive by design focusing on the components necessary to provide fire protection. The maintenance procedures, maintenance frequency, performance criteria, and evaluation procedures listed below have been established to ensure that Sweetwater Authority's fire hydrants meet fire standards and to instill confidence in our customers.

Fire Hydrant Inspection and Operation Frequency

Routine inspection and maintenance of fire hydrants and their auxiliary valves is required to verify functionality and to ensure they meet fire protection standards.

Inspection and Operation frequency:

- a. Each fire hydrant and auxiliary valve shall be inspected every three years.
- b. Preventive maintenance as listed below shall be performed every three years.
- c. Inspection and preventative maintenance should be performed concurrently if possible.

Fire hydrant operation and maintenance cycle are divided into three sections Bonita, City of National City and the City of Chula Vista. Cycle starts at the Perdue Water Treatment Plant working through Sweetwater Authority's quarter sections. Preventative maintenance work orders are generated automatically through the Maximo asset management system. Maintenance actions are documented in both Maximo and InfraMap.

Preparation for Fire Hydrant Preventative Maintenance

1. Generate preventive maintenance (PM) work order(s) in Maximo. Procedures can be found in the Maximo Processes for Distribution Manual, Section 3.4 PM Processes, 3.4.1 PM Work Order Generation. Work Order will be list the fire hydrant and the auxiliary valves by quarter section.

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2. Review quarter section in InfraMap and on the block maps to determine criticality, area of influence and to determine resources needed to perform maintenance.
3. Review the valve operation maintenance practice in Section 1 if needed.

Resource Planning

1. Ensure assigned laptop computer is properly charged
 - a. Vehicle charger
2. Traffic control requirements
 - a. Additional support
 - b. Blocking vehicle
3. Ensure assigned vehicle is properly equipped
 - a. Best Management Practices (BMP)
 - b. Fuel for vacuum unit
 - c. Proper hydraulic reservoir level
 - d. Inspect valve operator
 - e. Valve keys
 - f. Spanner wrench
 - g. Traffic control cones and emergency lighting
 - h. Paint, gaskets, o-rings, caps ect.

Internal and External Notifications

If auxiliary valve requires flushing in order to get proper shut down contact the Operations Clerks and request a water disturbance notification be sent out with the following information in order to properly notify both internal and external customers.

1. Number of customers affected by operation
2. Why the valve is being operated
3. How long customers may be affected

Notify Operations Clerk if fire hydrant is found to be inoperable and repairs cannot be made during PM ensure "Out of Service" ring is properly placed on fire hydrant. Operations Clerks will notify fire department out of service fire hydrant.

Fire Hydrant and Auxiliary Valve Maintenance

Fire hydrant and auxiliary valve maintenance is documented in InfraMap ensure all corrective action, inspection details and comments are properly logged into the valve card.

1. Log into InfraMap and open proper valve card

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- a. Verify that computer is connected to valve operator
- b. Verify Valve ID#
- c. Verify valve is plotted correctly on the map
 - i. If map is not correct make a Redline record in InfraMap

Jobsite Inspection - Prior to Fire Hydrant Operation

Inspect the general condition of the area around the fire hydrant (FH) and location and determine if FH is positioned correctly and at the proper elevation.

1. Check for exterior obstruction which may interfere with hydrant use in fire emergency (fences, walls, shrubs, etc.)
2. Notify homeowner if obstruction must be removed or trimmed. Make Field Crew Supervisor aware of situation.
3. Check whether the hydrant needs to be raised because of change in the grade.
4. Check for splash pad.
5. If repairs are required on "Standard," "Rich" or "Greenberg" fire hydrants, the fire hydrants shall be replaced due to the lack of available repair parts.
6. If deficiency is found that can not be corrected during the PM, generate a corrective maintenance (CM) work order in Maximo and document work order in the PM work order log.

Fire Hydrant and Auxiliary Valve Inspection and Maintenance Procedures

Step 1. Ensure auxiliary valve is in the open position, operate the valve fully.

NOTE: For auxiliary valve operation and maintenance please refer to Section 1 of this manual.

Step 2. Properly place BMP's in preparation of FH maintenance.

Step 3. Remove outlet nozzle caps and check for seat leakage visually at each valve.

Step 4. While under pressure check for leakage at joints, around outlet nozzles, at packing or seals and past outlet nozzle caps.

Step 5. Check and record the static pressure (make note of the time pressure was taken)

Step 6. If leakage is observed, tighten outlet nozzles, replace O'rings or replace gaskets.

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- Step 7.** Attach the diffuser with declor tablets and fire hose (if needed) to direct flow into the street. Open the hydrant and flush to assure the fire hydrant and lateral piping is free of foreign material. Document water loss.
- Step 8.** While closing the auxiliary valve open each valve on the FH. If stem action is tight, repeat operation several times until opening and closing action is smooth and free.
- Step 9.** With auxiliary valve closed and FH valves open inspect for thread damage, valve seat damage and inspect the barrel for debris. Water conditions may be such as to cause "Hard Water Build-Up" on stem threads. The above procedure usually is sufficient to remove this build-up by cleaning the threads through a series of opening and closing operations. If hard operation persists, remove valve stem, clean threads with wire brush and lubricate. Clean and lubricate outlet nozzle threads and use caps to check for easy operation of threads.
- Step 10.** While opening the auxiliary valve close FH valves to release air. Clean and lubricate outlet nozzle threads and use caps to check for easy operation of threads.
- Step 11.** Check nozzle cap chains for free action on each cap. If binding is observed, open the loop around the cap until the action is free so as to prevent kinking during removal of the cap under emergency conditions.
- Step 12.** Replace caps, tighten with spanner wrench, then back off on threads slightly so that the caps will not be excessively tight, but tight enough to prevent removal by hand.
- Step 13.** Clean the exterior of the hydrant and paint FH while ensuring over spray is controlled.
- Step 14.** Double check auxiliary valve to ensure that the valve is fully open.

Considerations

Torque needed for Operation

The amount of torque needed to operate a valve can be an indication for the need for additional maintenance. Corrosion or dirt can hamper the operation of the valve,

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making it less easy to operate. Regular torque measurements can provide information on the speed of this process. Results should be interpreted in relation to the valve specifications.

Noise level

Increased noise levels over valves may indicate a problem such as partially closed valves. This may lead to cavitations. Acoustic measurements are used to assess whether or not a valve is fully closed. Interpretation of results can be difficult, especially when other sources of noise are present.

Considerations (continued)

Fire Hydrant and Valve Manuals

Fire hydrant and valve manufacturer's manuals are to be followed to prolong the service life of the device and to prove rights to warranty if necessary.

Data Reporting

1. Complete the fire hydrant and auxiliary valve inspection and maintenance reporting any abnormal operating conditions and noting any need for maintenance or fire hydrant and/ or valve replacement. All pertinent information shall be documented and recorded in InfraMap.
 - a. Laptop computer shall be properly synchronized after each shift
 - b. Laptop computer shall be left to charge on the second floor at Operations after each shift
2. The Parent Maximo PM work order shall be used to document all labor and equipment used to perform valve maintenance for the quarter section.
3. If a CM work order(s) are generated from this Parent PM work order the CM work order number with a description of findings shall be put into the Parent PM work order log.
4. Any deficiencies found shall be reported on a Maximo CM work Order documenting the valve number (asset) and the age of the valve in the description.
5. All CM work orders shall be generated and given the "Waiting Approval" status before the end of each shift.