INSPECTION REQUIREMENTS

- The person who did the install shall have a current Certificate of Competency (minimum of: Level 1) as issued by the Office of the Washington State Fire Marshal. For questions or special circumstances, please contact our office at 253-798-7179
- You will need to have the cut sheets ready on site for the inspection (these are the manufacturer's specifications on the sprinkler head)
- There will need to be a bucket test/flow test done during the inspection, so you will need to have the test gear ready on site. For more information, please see instructions below

CONDUCTING A FIRE SPRINKLER FUNCTIONAL FLOW TEST (BUCKET TEST)

Flow test setup

The four following requirements are necessary for a proper flow test.

1. Pressure gauge installed immediately downstream from the system's main shutoff valve
2. Marked bucket capable of holding 30 gallons of water
3. Long piece of 2" or larger rigid pipe
4. Flow test assembly (**Figure 1**)

The pressure gauge records the residual pressure during the flow test. To measure accurately, the gauge must have a maximum pressure reading that is slightly higher than the normal static pressure.

For example, if the static pressure is 65psi, install an 80psi gauge. Note that a gauge that reads too high will not measure the lower residual pressures adequately.

The pressure gauge is also critical should troubleshooting be necessary.

Figure 1: Flow test assembly

Flow test assembly

The flow test assembly consists of the following parts (**Figure 1**).

- Short, ½" galvanized, threaded nipple (4" maximum)
- Two ½" x 1" galvanized, threaded bushings
- 1" full-port ball valve
- Appropriate sprinkler orifice

You can add an optional gauge trim consisting of an additional short, galvanized threaded nipple, a ½" galvanized threaded tee, a ½" x ¼" galvanized threaded bushing and a 30psi or 60psi pressure gauge.

The flow test bucket can be anything that can hold 30 gallons of water (**Figure 2**). This bucket will need to be marked before performing the flow test. To mark the bucket, fill the bucket in one-gallon increments and mark each water level with a waterproof marker until you reach the 30-gallon level. Make sure all measurements are as accurate as possible since slight variations could dramatically affect the final waterline. This bucket can be used for multiple flow tests.

The rigid pipe can be cut-to-length on the jobsite. It is used to direct the flow of water into the bucket.

Figure 2: Flow test setup

Performing the test

1. Locate the most hydraulically demanding sprinkler. The demanding sprinkler is shown on the fire protection drawing in the 'Hydraulically Most Remote Heads' detail.
2. With the system turned off and drained, remove the sprinkler from the sprinkler adapter fitting.
3. Insert the flow test assembly.
4. Attach the test orifice to the end of the test assembly. The test orifice must match the size of the hydraulically demanding sprinkler. Dismantling a spare sprinkler is the best way of insuring you have the proper orifice size.
5. Charge and fill the system.
6. Open the ball valve on the test assembly and flow water until air is completely out of the system. Trapped air will negatively affect the flow test.
7. Once air is purged, close the ball valve on the test assembly and prepare the test bucket.
8. Open the apparatus and perform a timed flow for one minute.
9. If the amount of water in the bucket matches or exceeds the calculated flow on the plan, the flow test is a success.
10. If the water in the bucket does not equal the calculated flow on the plan, review the troubleshooting checklist and perform the flow test again.

Troubleshooting

All flow test failures fit into one of the following three categories.

1. Problem in the system supply
2. Problem in the system piping
3. Problem in the flow test procedure or equipment

In the event of a flow test failure, make sure all valves (angle-stop valve, curb stop, main shutoff valve, flow test kit valve, etc.) are completely open and free from obstruction.

Perform the flow test again and get an accurate residual (flowing) pressure from the gauge you installed. Since each system has been hydraulically calculated to perform at a certain pressure at the main shutoff valve, the pressure reading will help determine whether the problem is upstream in the supply pipe or downstream in either the system or flow test assembly.

Potential system supply problems

- Underground pipe sizes do not match those shown on the plan
- Pipe distances do not match those shown on the plan
- Meter size is different (verify both inlet and outlet side of the meter)
- Additional fittings have been installed
- Extra valves have been installed
- PRV (if present) is not completely open
- PRV (if present) does not match size, make or model shown on the plan
- Elevations do not match those shown on the plans
- Supply pump/booster pump does not match the plan requirements

Potential system piping problems

- Trapped air
- Kinked or flattened tubing
- Missing cross connections or other missing tubing
- PRV (if present) is not completely open
- PRV (if present) does not match size, make or model shown on the plan
- Tubing sizes do not match those shown on the plan
- Tee orientations do not match those shown on the plan

Potential flow test procedure or equipment problems

- Test was not performed for the full 60 seconds
- Test bucket is improperly marked
- The incorrect test orifice was used
- The water was directed through a flexible line into the bucket instead of a rigid pipe resulting in high friction loss
- The nipples on the test assembly are too long, resulting in high friction loss
- The test valve is defective
- The test valve is not full port
- Teflon® tape is causing an obstruction