Clark-Cowlitz FIRE RESCUE	Fire Code Standard Fire Sprinkler System Fire Department Connection	
	Date: 01-28-2021	**Number: 9 - 2**

Purpose

This Standard is a summary of Clark-Cowlitz Fire Rescue (CCFR) interpretations of State Codes and National Standards. Information contained herein applies to typical instances and may not address all individual circumstances.

This Standard is intended to provide direction for the installation of a Fire Department Connection (FDC) as part of an approved automatic fire sprinkler system or standpipe system.

Code References

Washington Fire Code as adopted and amended by Clark-Cowlitz Fire Rescue.

National Fire Protection Association (NFPA) Standard 13, Installation of Fire Sprinkler Systems

NFPA Standard 13R, Installation of Fire Sprinkler Systems in Low-Rise Residential Occupancies.

When Required

1- All fire sprinkler systems constructed under the NFPA 13 Standard for commercial and industrial occupancies shall have one FDC as described in this standard.
2- All fire sprinkler systems constructed under the NFPA 13R Standard for low-rise residential occupancies shall have one FDC if the building exceeds 2,000 square feet or is more than a single story.
3- Buildings, due to size, arrangement, location, and number of systems may be required to have more than one FDC, in multiple locations, as required and identified during the plan review process.

Location

The FDC shall be located such that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of the FDC shall be approved by the Fire Marshal during plan review.

In addition, the FDC shall:

1- Be located so as to be visible from the street side of the building or facing the approved fire apparatus access roadway.
2- If possible, be a minimum of 20 feet from the building, or the height of the building plus 10 feet, whichever is greater.
3- Be located a minimum of 3 feet behind roadway curb or back of sidewalk.
4- Shall not be located behind fences, landscaping or other barriers.

Distance to a Fire Hydrant

The FDC shall be located within 100 feet of an approved public or private fire hydrant, located on the same street or roadway as the FDC.

Access to FDC

The FDC shall be accessible to the street or roadway and not blocked by:

- Fences
- Bushes
- Trees
- Walls
- Landscaping
- Or any other fixed or moveable object.

The FDC shall have a clear working space of 36 inches around the FDC and an unobstructed height of 78 inches. This clear space shall be maintained.

Physical Protection

Where FDC's are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312, Washington Fire Code

Hose Connection

The FDC shall have one hose connection meeting the following requirements:

- For NFPA 13 Systems, provide one 5-inch Storz hose coupling inlet.
    - Exception: All systems that have a working pressure over 150 PSI, shall have the appropriate number of 2.5-inch national hose inlets, based on system demand.
- For NFPA 13R Systems, provide one 2.5-inch national hose coupling inlet.
- Hose inlet shall be on a drop-elbow, placing the connection 30 degrees below horizontal.
- All hose coupling inlets shall have the appropriately sized locking Knox cap.
- The hose connection shall be 30 – 48 inches above grade.
- FDC shall be painted red in color.
- Provided with signage as described in this standard.

Signage

When an FDC services multiple buildings, structures, locations, or a portion of a building, a sign shall be provided indicating the buildings, structures or locations served.

Where there are multiple FDCs, each FDC shall be labelled as to their respective system/area covered.

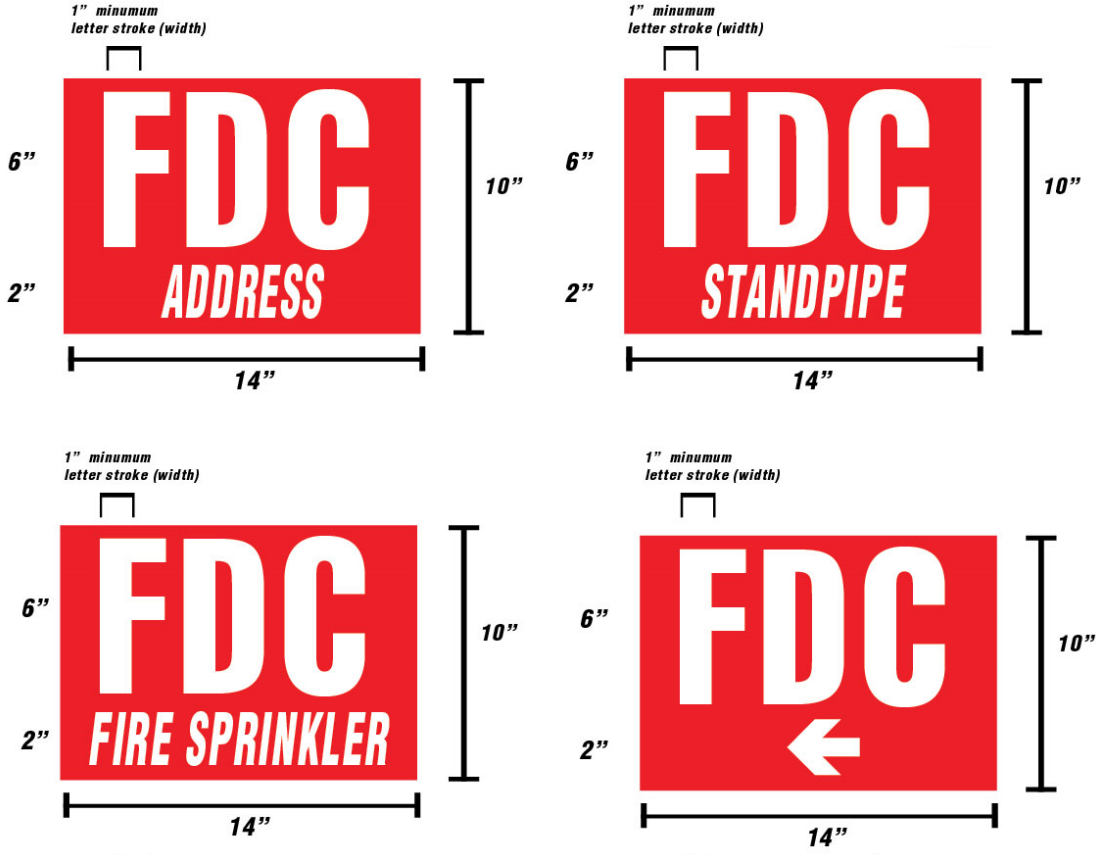
Where the system demand exceeds 150 PSI, a sign located at the FDC shall indicate the required pressure.

For FDC's mounted directly on the building wall, a sign reading "FDC" in 6-inch letters with a **RED** background and white lettering, placed on the wall above the FDC at an approved location, visible from the fire apparatus access roadway.

Remote FDC signs shall be permanent in construction, with a minimum size of 14"x10", with a **RED** background in color and white lettering "FDC" letter's shall be at least 6-inch in height, the sign shall be mounted to the vertical FDC piping with a U-bolt. The

identifying lettering below the letters “FDC” shall be a minimum size of 2” in height and also white in color. (see examples)

Examples of signage:



Construction Requirements

Materials

All piping materials and fittings shall be listed for use and meet the requirements of NFPA Standard 24, *Installation of Private Fire Service Mains.*

Corrosion Protection

All unprotected bolted joints and accessories shall be cleaned and coated with a corrosion-retarding material after installation. All above-ground piping shall be painted a red color, excluding hose connection adapters.

Protection from Freezing

The top of underground pipe shall be buried a minimum of 3-feet below grade (1-foot below the frost line).

The piping between the check valve and the outside hose coupling shall be equipped with an approved automatic drip valve. The drip valve may be on the horizontal run of pipe or on the vertical FDC pipe, as long as the drip valve is at least 3-feet below grade. If the drip valve is un-accessible, it shall be surrounded with suitable drain rock and felt.

Piping under buildings and foundations

Piping entering a building and running through the concrete flooring shall be sleeved so as to provide a 2-inch gap between the piping and the concrete flooring.

Piping shall be installed a minimum of 12-inches below all foundations and footers. Exception: When the piping is sleeved through the foundation.

Restraint

Underground piping shall be restrained against movement at changes of direction by one of the two acceptable methods:

1. **Restrained Joint Systems:**

- Locking mechanical or push on joints
- Mechanical joints utilizing setscrew retainer glands
- Bolted flange joints
- Pipe clamps and tie rods
- Other approved methods or devices

2. **Thrust Blocking**

   Thrust blocks shall be permitted where soil is stable and capable of resisting the thrust forces.

   Thrust blocks shall be installed between the joint to be restrained and undisturbed soil and be engineered to support the force from the particular pipe size.

Tracer Wire

Tracer wire (#12 insulated copper wire), shall be installed on underground piping systems, secured to the top of the pipe at 10-foot intervals

Inspections

Visible

All piping, joints, thrust blocking and sleeving shall be inspected by CCFR prior to backfilling.

In Building Riser Sets

Pre-manufactured In Building Riser (IBR) sets shall be inspected prior to cover to insure proper clearance to foundation and depth of cover.

Flush

FDC underground shall be flushed at a velocity of 10 feet/second. To meet this speed requirement, minimum flows should be as follows:

Pipe Size	Flow
4-inch	390 gpm
6-inch	880 gpm
8-inch	1560 gpm
10-inch	2440 gpm
12-inch	3520 gpm

Flushing should continue until the water flow is verified to be clear.

Hydrostatic

Hydrostatic testing of the FDC underground piping shall consist of 200 psi for a duration of 2 hours, or 50 psi above system working pressure, whichever is greater. The system shall maintain that pressure +/- 5 psi for the 2 hours. Any visible leakage from the system is an automatic test failure.