

**CORVALLIS FIRE DEPARTMENT
DEPARTMENTAL OPERATING GUIDELINES**

D.O.G. 11.2.8
DATE: 11/16/2001
REV: 11/17/2003

FIRE SPRINKLER SYSTEMS

PURPOSE

To establish guidelines which detail specific installation and testing requirements for appurtenances installed on or for automatic fire sprinkler (NFPA 13) systems, including:

1. Fire department connection (FDC)
 - a) location and design of installation
 - b) signage - partial or multiple systems
 - c) provisions for automatic draining of FDC service pipeline
2. Water flow alarm bell (both electrical and water motor operated)
 - a) location/installation of
 - b) design and operation of bell unit
3. Signage/marketing of maximum commodity storage height
4. Signage/marketing of multiple system division line/s
5. Acceptance requirements for underground piping
6. System design

This guideline **does not** cover all the requirements or details, nor is it an attempt to restate all of the requirements or details for appurtenances installed on or for sprinkler systems addressed by NFPA 13 **but addresses only those items listed above**, the specific details of which may not be adequately identified by existing code language.

AUTHORITY FOR APPROVAL AND TESTING - UFC SECTION 1001.4, 1997 ed.

(The following is a condensed version of the UFC language.) Automatic sprinklers and appurtenances thereto shall meet the approval of the Fire Department as to installation and location and shall be subject to such acceptance tests as required by the Chief and as defined in UFC Appendix III-C, UFC Appendix Standard A-III-C-1, 1997 edition, NFPA 25, 1998 edition.

FIRE DEPARTMENT CONNECTION (FDC) The location of the FDC shall be identified by the applicant and approved by the City prior to issuance of the site utilities permit.

1. Location and Design of Installation
 - a) FDC shall be visible, easily accessible, and installed in front of the building. The front of the building, as used here, is considered to be the address side and that side that would normally front on a public or private street and would usually include the primary entrance to the building.
2. The FDC shall be located as specified in a) through d) below:
 - a) Forty (40) feet from the protected structure;
 - b) Two (2) feet behind the curb face or rear edge of the sidewalk; and

- c) Not less than 18 inches nor more than 4 feet above the level of the adjacent grade or access level; and
- d) Within 150 feet of a hydrant but not closer than ten (10) feet.
- EXCEPTION: Where it is technically infeasible to meet the above dimensions, an alternate FDC location shall be proposed for review that meets the intent of the above-stated parameters and shall be approved by the Fire Department prior to installation.
3. Systems designed for a total combined water demand of 2,100 gpm and over shall be equipped with an FDC having a minimum of four (4) 2 ½ inch N.S. clappered inlets Siamesed into a minimum six (6) inch pipe.
4. FDC Signage
- a) If the FDC serves a partial system, such as a basement, the sign shall indicate the area served (i.e., "basement only")
- b) If the FDC serves more than one address, those address numbers shall be listed on the FDC.
- c) The signs required by Items "a" and "b" above shall be permanently attached to the FDC riser, constructed of metal, with reflective red, one (1) inch high lettering, 1/4 inch stroke, on a reflective white background. These signs shall be constructed on standard aluminum .080 stock.
- d) Signs shall be securely mounted to the FDC riser and located in a position so that it does not interfere with making the necessary hose connections.
5. Draining of the FDC service pipeline:
- a) The piping between the single check valve and the outside hose coupling shall be equipped with an approved automatic drip.
- b) The FDC piping shall be installed so that when the FDC is not pressurized, all residual water will flow to a single point for evacuation through the automatic drip valve. The automatic drip valve located at the piping low point shall be provided with a means for disposal of the water. The proposed means of disposal shall be shown on the plans submitted for review and approval.

If the double detector check is located at an elevation lower than the FDC supply piping, the automatic drip valve would be located in the area of the double detector check and would utilize the drain provisions required and provided for that area. In this scenario the drain provisions (at the low point) would be those located:

* in the double detector check vault AND consist of a:

- sump pump;
- drain to daylight; OR
- connect to storm drain.

OR

* at floor level within a structure when the double detector check is installed on the sprinkler riser and consists of a:

- floor drain OR
- sump pump.

Note Diagrams 11.2.8A and 11.2.B .

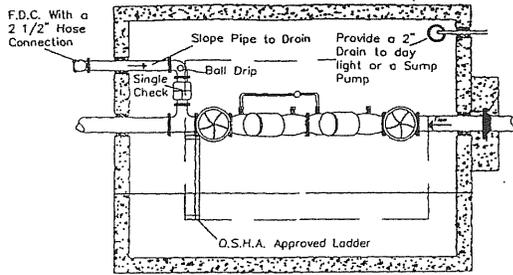


Diagram 11.2.8A

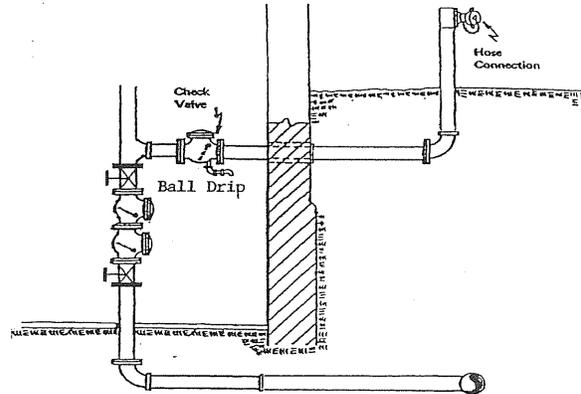


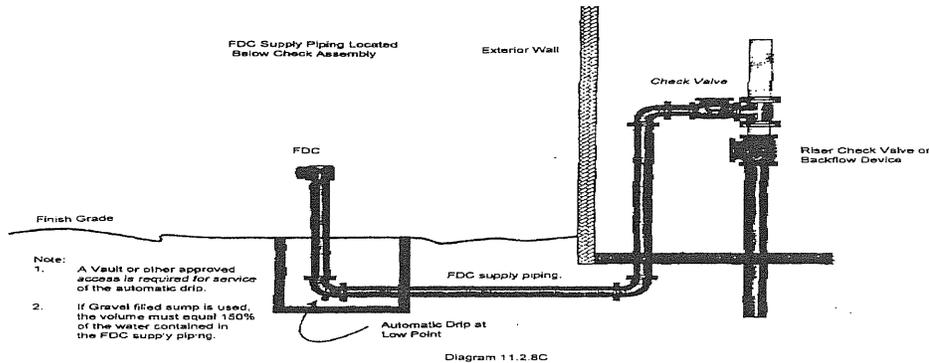
Diagram 11.2.8B

If the double detector check is located at an elevation higher than the FDC supply piping, provision for accommodating the drain flow from the automatic drip valve located at the base of the FDC riser shall be provided at that location. Adequate drainage and access to the auto drip valve for inspection, testing, and maintenance shall be provided. Adequate drain provisions for the automatic drip valve may consist of a:

- sump pump;
- drain to daylight;
- connection to storm drain; OR
- gravel filled sump.

If a gravel filled sump is used for draining the FDC piping, it shall be designed to provide adequate drainage, during all seasons, for the volume contained within the FDC supply piping, from the Siamese connection to the single check valve. Easy access may be provided by utilizing a small vault enclosure around the auto drip valve. If the low point of the FDC piping, where the auto drip valve is located, is not provided with this access, and instead is back filled with gravel and earth, failure of this valve will require excavation of this area to facilitate replacement of the defective valve. Note Diagram 11.2.8C.

Standing water in the FDC supply line or failure of a low pressure hydrostatic test applied between the FDC Siamese inlets and the single check valve located near the sprinkler riser, may indicate a faulty automatic drip valve.



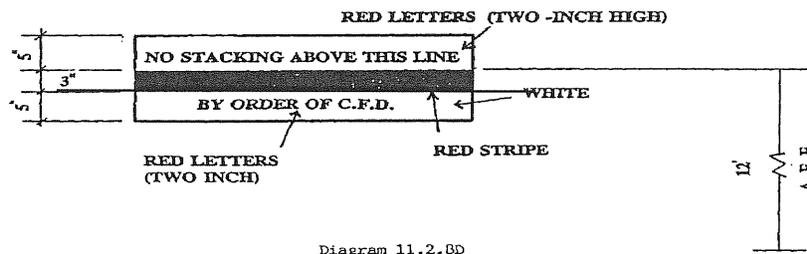
WATER FLOW ALARM BELL (Both electrical and water motor operated)

1. Location/installation of:
 - a) The water flow alarm bell for a single building shall be located on the face of the building closest to the FDC, directly in line with and behind the FDC. When a single FDC serves more than one building, the above design parameter shall apply to the largest or primary structure [note Item b below]. The alarm bell shall be installed at a height of at least eight (8) feet above prevailing grade, but no more than twelve (12) feet.
 - b) If a single FDC serves more than one building, a water flow alarm bell shall be provided for each protected structure. These bells shall operate independently of each other and only when there is a water flow within the building to which each is attached. To avoid audible confusion, these units shall be bell/strobe assembly/ies and listed for exterior installation. The bell/strobe assembly/ies shall be visible from the FDC location. The location of the bell/strobe assembly/ies shall be specified by the applicant on the fire sprinkler plans and shall be approved by the City on these plans prior to issuance of the permit authorizing sprinkler system installation.
 - c) When a contiguous building (or buildings in the case where area separation walls exist) has multiple Fire Department Connections, the individual FDCs and water flow alarm bells shall be labeled in a manner to correlate each water flow alarm bell to the appropriate FDC, either by address (i.e., suite 1, 2, etc., or Suite A, B, etc.); sprinkler system number or letter (i.e., 1, 2, or A, B, etc.); or by direction (i.e., east system, west system, etc.).
 - * The signs on the FDC shall be constructed as outlined in “4c” and “4d” above.
 - * Those signs for the water flow alarm bells, identified in “c” above, shall be red lettering four (4) inches in height, with a ½ inch stroke and mounted immediately below the alarm bell.

SIGNAGE/MARKING OF MAXIMUM COMMODITY STORAGE HEIGHT

In factories, industrial storage, and retail sales occupancies where commodity storage methods or pile heights can exceed the design parameters of the sprinkler system, permanent signage shall be provided identifying the maximum allowed storage height.

High-piled combustible storage is storage of combustible materials in closely packed piles or combustible materials on pallets, in racks, or on shelves where the top of storage is greater than twelve (12) feet in height. When required by the Chief, high-piled combustible storage also includes certain high-hazard commodities, such as rubber tires, Group A plastics, flammable liquids, idle pallets, and similar commodities, where the top of storage is greater than six (6) feet in height. All high piled storage areas shall be signed identifying the maximum storage height as shown in Diagram 11.2.8D below:

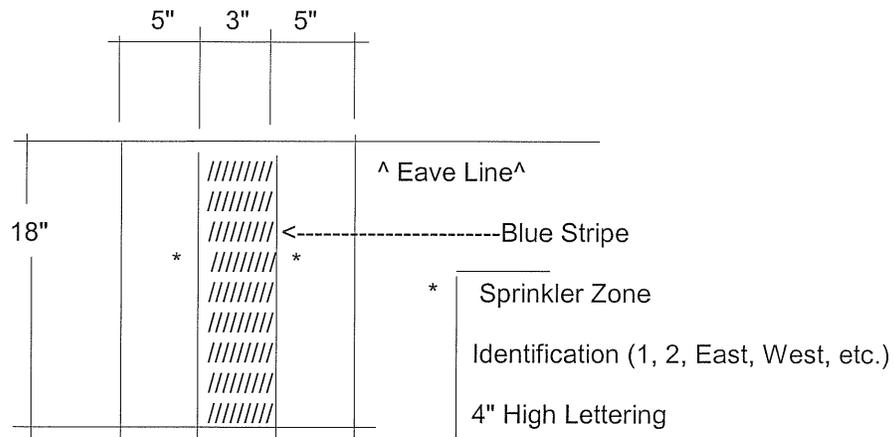


Notes:

1. This sign must be posted prior to building being occupied.
2. Signage shall be displayed fifty (50) feet on center, located on storage area walls starting twenty-five (25) feet from any exterior corner.
3. Support columns shall be marked at the maximum storage height with a three (3) inch red band, paint or tape. Lettering on columns is not required.

SIGNAGE/MARKING OF MULTIPLE SYSTEM DIVISION LINES

When a contiguous building (or buildings in the case where area separation walls exist) is protected by more than one sprinkler system, those sprinkler system divisional lines shall be permanently identified on the exterior of the structure as shown in Diagram 11.2.8E below:



The sign shall be centered on the sprinkler system divisional line and mounted on the exterior of the building at the top of the wall or eave line.

If the division line is at an inside corner created by exterior walls, the sign must be folded lengthwise at a 90 degree angle to fit the corner.

ACCEPTANCE REQUIREMENTS FOR UNDERGROUND PIPING

Prior to conducting hydrostatic tests for associated sprinkler piping, the private fire service mains and lead-in connections to system risers shall be thoroughly flushed before connection is made to sprinkler system piping. The flushing procedure shall be conducted in accordance with NFPA 13, Section 8-2. Upon completion of the underground piping work, inspection, flushing and testing, the *Contractor's Material and Test Certificate for Underground Piping* shall be completed and submitted to Development Services, for review and permanent record.

Prior to conducting the underground piping flush procedure, an approved disposal area shall be determined by a representative of Development Services for the water issuing from the test outlets.

SYSTEM DESIGN

Subsequent to design and plan submittal for review of an hydraulically calculated fire sprinkler system, the volume and pressure of the public water supply shall be determined from water flow test data. If no current flow data is available, an approved test shall be conducted by a fire sprinkler contractor, a fire protection engineer, a NICET Level III sprinkler designer, or a representative of the Fire Department. Corvallis Public Works Department shall be notified prior to performing any hydrant water flow tests. Approved testing shall utilize the flow test procedure identified in NFPA 13, Section 7-2.1 (see NFPA 13, Appendix A / Explanatory Material, Section A-7-2.1).

At the conclusion of the flow test, documented results shall be submitted to representatives of Development Services and the Fire Marshal's office for review and permanent record.

Dan Campbell, Fire Chief

Next scheduled review: November, 2006