

The International Fire Code (2003 edition) provides for mitigation in the form of automatic fire sprinkler protection for buildings that have identified deficient access or poor firefighting water supply) conditions. These code provisions are intended to provide flexibility for owners to construct structures on difficult sites and still maintain a reasonable degree of fire and life safety. Section 503 of the fire code indicates that when buildings are completely protected with an approved automatic fire sprinkler system, the provisions that require fire apparatus access roads may be modified when approved by the Fire Chief. In addition, Section 503 of the IFC requires an approved water supply capable of supplying the required fire flow for fire protection to all newly constructed buildings. The use of automatic sprinkler systems can serve to mitigate the total gallon per minute requirement as approved by the Fire Chief.

The following outlines both the philosophy and requirements for residential sprinkler installations intended to provide mitigation for deficient available fire flow or fire apparatus access:

System Oversight

1. All Sprinkler Plan Reviews are performed by the Bellevue Fire Department.
2. Installation of single family residential sprinkler systems performed inside the City of Bellevue inspected by the Building Division of Planning and Community Development.
3. The installation of single family residential sprinkler systems outside the City of Bellevue but within the corporate limits of contract jurisdictions served by the Bellevue Fire Department as inspected by the Bellevue Fire Department.

Governing Fire Code Provisions

1. IFC 503.1.1, Exception 1 allows fire road access requirements to be modified by the Chief when buildings are **completely sprinklered**.
2. IFC B105 allows UFC Appendix B to be used to determine the required available fireflow for a structure. Table B 105.1 establishes the required fire flow for a building and provides for a reduction in flow if an **APPROVED fire sprinkler system is installed**.
3. Most single family residential sprinkler systems are designed from the basis of an **NFPA-13D system**, but contain certain modifications deemed necessary to comply with IFC 503 and FIC B 105 for a "completely sprinklered building". These technical modifications are published in the Bellevue Fire Department Development Standards (BFDDS)
4. These designs are review and then stamped "**APPROVED**" during the plan review phase.
5. Single family residential sprinkler systems are to be inspected for compliance with the APPROVED permit drawings.

Sprinkler System Objectives

- Automatically detect a residential fire.
- Alert occupants to evacuate the residence.
- Control the size of the fire by preventing "flashover" and restricting it to the room of origin until the Fire Department arrives and can deploy its apparatus.
- Alert the Fire Department that a fire has started.

Sprinkler System Details

1. All systems will have a 1" minimum City water service and meter. The underground and water meter installation is inspected and approved by the City of Bellevue Utilities Department.

2. The lead-in pipe size shall be as shown on the APPROVED Plans. The inspector shall test the supply piping up to the back-flow preventer at City pressure, and ensure that the supply piping has been flushed until clear.
3. The back-flow preventer will be 1" minimum size and a flow interrupter, which shuts off domestic flow upon operation of a sprinkler, will be provided if required on APPROVED drawings.
4. All houses under 10,000 sq. ft. will be hydraulically designed to operate 2 sprinklers. A performance test is required using a 2 sprinkler head bucket test. A flow interrupter must be tested for its ability to stop an open bathtub faucet when the sprinkler flow is functioning. The two sprinklers tested must flow 26 gpm in one minute. Houses over 10,00 sq. ft. are required to be hydrostatically designed.
5. A wall-mounted 1.5" fire department connection (FDC) will be provided on all residences larger than 3,600 sq. ft. and elsewhere as noted on the APPROVED drawings (BFDDS 6-7.07.11.d).
6. A wet sprinkler system must be used, except by specific approval. Pre-action and dry systems must be installed according to NFPA-13 criteria and are not within the scope of this testing procedure.
7. All sprinkler piping downstream of the back-flow preventer must be tested at 200 psi for 2 hours, leak free (BFDDS 6-7.07.14).
8. Sprinklers may be omitted only from those spaces shown without sprinklers on the approved permit drawings.
9. Garages shall be protected with the wet sprinkler system employing the building insulation envelope and dry pendent or dry sidewall sprinklers (100 or more sprinkler heads). Although every attempt will be made to ensure complete sprinkler coverage, It is likely that in garages some areas will not be fully protected.
10. Wet piping that is protected from freezing by the building insulating envelope will be inspected as to the quality of the insulation coverage, both in the garage and in attic areas.
11. The sprinkler riser is frequently located in an unheated garage near the furnace or water heater. If a concern of freezing exists, provisions must be made to ensure that the sprinkler piping is protected from freezing.
12. The water-flow notification system must provide an alarm comparable to residential smoke detectors in all sleeping quarters and in all common living areas.
13. For those sprinkler system that require central station monitoring, this requirement for central station or security system remote supervision will be noted on the APPROVED permit drawings. A supervised home must be tested by directly contacting the monitoring company and performing a water-flow alarm test.
14. Residences that have been permitted with the condition for protection by a "13R" or "13" type sprinkler system will be inspected by the Fire Department.