

RESIDENTIAL SPRINKLER SYSTEMS

Pennsylvania Regulations Under the 2009 International Residential Code

Background

Pennsylvania adopted the 2009 edition of the International Residential Code (IRC) on December 31, 2009. One of the most significant additions to the 2009 IRC is the requirement to install residential sprinkler systems within newly constructed townhomes by 2010 and one and two family homes by 2011.

The new residential sprinkler requirements are added to the 2009 IRC in order to protect life, unlike commercial systems which are designed to reduce property damage. The proposed residential sprinkler systems are intended to control fire growth long enough to allow for people to escape a burning building and/or to allow fire fighters to perform rescue operations. The sprinkler system is designed to keep fire gases below lethal concentrations, maintain visibili-



Newly constructed townhomes must be equipped with sprinkler systems beginning January 1, 2010; new one and two family homes must have systems beginning January 1, 2011.

ty and prevent temperatures from exceeding 150° F in the area of the fire so that the occupants have enough time and the ability to safely exit the building.

Exemptions to Compliance Date

While the requirements for new townhomes and one and two family homes to install residential sprinklers take effect on January 1, 2010 and January 1, 2011, respectively, two exemptions are recognized:

1. If a design or construction contract for the construction of a dwelling was signed prior to December 31, 2009, the work

is considered to fall under the 2006 IRC instead of the 2009 IRC.

2. If an application is submitted for a Uniform Construction Code building permit prior to either of the noted effective dates for the residential sprinkler requirement; the construction will not be subject to the 2009 IRC requirements.

Areas of Residences Not Required to be Protected by Sprinkler Systems

Sprinklers are required to be installed in all but the following areas of a newly constructed residence:

- Attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances. (However, if the space contains fuel-fired equipment, sprinklers are required to be installed above the equipment, but not the remainder of the space.)
- Clothes closets, linen closets, and pantries not exceeding 24 square feet (SF) in area, with smallest dimension not greater than 3 feet.
- Bathrooms not exceeding 55 SF in area.
- Garages, carports, exterior porches, and unheated entries adjacent to an external door.

Design Requirements

The following codes may be used in the design of residential sprinkler systems for one and two family homes and townhomes:

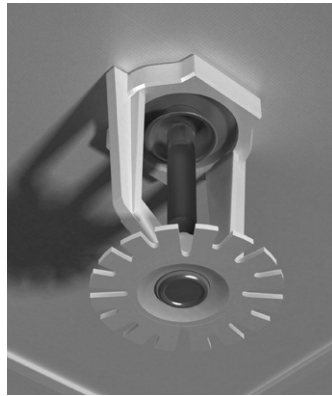
- National Fire Protection Agency (NFPA) 13D for one and two family dwellings and townhomes
- International Residential Code P2904

Residential sprinkler systems can be constructed as wet systems, dry systems or dual interlock pre-action systems. Presently there are no residential sprinkler heads on the market for a dry system. Because the residential sprinkler heads are fast response type, commercial sprinkler heads cannot be used, except in unheated and unoccupied areas.

The systems can be installed as tree, networked or looped systems that consist of the following permitted piping materials; black iron or steel, copper, CPVC or PEX pipes. The systems can also be constructed using dedicated fire service lines or with multipurpose systems that are integrated with the domestic water system.

Under NFPA 13D requirements, the sprinkler systems must be designed to simultaneously operate two sprinkler heads for the following lengths of time:

- A 7 minute demand time is required for a one story dwelling less than 2,000 square feet
- A 10 minute demand time is required for a two story dwelling or a dwelling greater than 2,000 square feet



Water flows between 26 and 42 gallons per minute are needed to provide the required demand time noted above. If the water system cannot provide the necessary flow, or the dwelling is served by a well, a water storage tank and a pump are needed to provide the necessary flow. In a typical system the water storage requirements would be 275 to 300 gallons. Emergency power is not required for the pump associated with the water storage tank.

Impact on Private Water Companies and Municipal Water Authorities

While the 2009 IRC permits multipurpose systems, many private water companies and municipal water authorities are requiring a separate dedicated fire service. A single line can be connected to the main, but the service is split into separate domestic and fire services at the curb stop. Both service lines are metered and the customer is billed for the largest service. Under this

Many municipalities may not have the required pressures available within their water systems to meet the sprinkler system operating requirements and provide the additional fire flow.

arrangement the domestic water can be shut-off in the event of nonpayment of the water bill and the fire service will remain active. This is being done because water companies and municipalities are concerned about the liability of multipurpose systems if the water is shut-off and the dwelling is left without fire protection. This precaution requires the water companies and municipal authorities to bear the additional material and labor costs

required to install and monitor the separate meters and service lines for the dedicated fire flow services.

Many municipalities may not have the required pressures available within their water systems to meet the sprinkler system operating requirements and provide the additional fire flow. If the municipalities do not have adequate pressure available, either the water system will need to be upgraded or developers will need to install storage tanks and pumps within the dwellings.

Certification/Licensure Requirements for Sprinkler Design

Currently, Pennsylvania has no state certification or licensure requirements on persons who design or install residential sprinkler systems; however, it should be noted that local requirements could be more strict than the state's requirements. While it is the home builder's responsibility to design the system, there are several companies that will custom design systems for the builder.

Currently Pennsylvania has no residential certification category for residential sprinkler system plan examination. The Pennsylvania Department of Labor and Industry (L&I) is recommending that the code official certified as a Residential Plumbing Inspector (category 13) be primarily responsible for plan approval and inspection. L&I is also advising that the Residential Building Inspector (category 10) and the Residential Electrical Inspector (category 11) be involved to identify potential framing obstructions, the need for thermal barriers (if required), and to inspect and approve any electrical connections.

Recent Legal Activity

The Pennsylvania Builders Association requested a preliminary injunction enjoining the Department of Labor & Industry from enforcing its regulation adopting the 2009 IRC. However, on March 10, 2010, a Commonwealth Court Judge denied the request. The result of this decision is that the 2009 IRC Code remains in effect in Pennsylvania. The Pennsylvania Builders Association has subsequently filed an application for summary relief, which will be briefed and then argued during the June argument session.

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