Boulder County

Boulder County
Land Use Department
Publications

Residential Fire Protection System

Land Use Department
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Closed Tuesdays 8-10 a.m.

Building Permits can be applied for
and issued until 4 p.m.

Residential Fire Protection System

Per section R313 of the Boulder County Building Code.

Automatic Fire Sprinkler System

Effective for all building permit applications received on or after January 1, 2013, an automatic fire sprinkler system shall be installed throughout dwellings where one of the following is proposed:

1. All new one and two family dwellings.
2. Additions to existing one- and two-family dwellings. When the sum of the total floor area of the addition plus the existing one- and two-family dwelling is increased to 4,800 sq. ft. or greater. The floor area of detached structures having floor areas of 120 square feet or greater that are located less than 50 feet from the dwelling shall be included in the floor area calculated for the dwelling.

Exception: One-time additions not exceeding 200 square feet in floor area.

3. Remodels/renovations to existing one- and two-family dwellings with a floor area of 4,800 sq. ft. or greater where renovations or remodeling work for which a building permit is required takes place in more than 50% of the area within the structure.

Design and installation:

Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D. Systems shall be installed with a fire department connection (FDC) and other associated devices when required by the fire code official.

Requirements in 2013

Section R313 of the 2009 edition of the International Residential Code ("IRC") included requirements that an automatic residential fire sprinkler system be installed in all new one- and two-family dwellings and townhomes, regardless of size. The Colorado Joint Ad-Hoc Residential Sprinkler Committee, after reviewing the new code requirements and the circumstances in Colorado, recommended that the effective date for the sprinkler requirements be delayed until January 1, 2013. When Boulder County adopted the 2009 IRC, effective January 1, 2011, this delayed effective date for the residential sprinkler requirements was incorporated into the adoption.

The current residential sprinkler requirements of Section R313 of the Boulder County Building Code, as amendments to the 2012 edition of the International Residential Code (IRC), are listed on page 2.

IRC Section R313 • Automatic Fire Sprinkler Systems

The current residential sprinkler requirements of Section R313 of the Boulder County Building Code, as amendments to the 2012 edition of the International Residential Code (IRC):

R313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in townhouses.

R313.1.1 Additions to existing townhouses. An automatic residential fire sprinkler system shall be installed throughout existing townhouses with additions when the sum of the total floor area of the addition plus the existing townhouse is increased to 4,800 sq. ft. or greater.

Exception: One-time additions not exceeding 200 square feet in floor area.

R313.1.2 Design and installation. Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with Section P2904. Systems shall be installed with a fire department connection (FDC) and other associated devices when required by the fire code official.

R313.2 One- and two-family dwellings automatic fire systems. An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.

Exception: An automatic residential fire sprinkler system shall not be required for federally-certified manufactured dwellings or Colorado Department of local Affairs, Division of Housing, state-certified factory-built dwellings that are certified to editions of the International Residential Code prior to the 2012 edition.

R313.2.1 Additions to existing one- and two-family dwellings. An automatic residential fire sprinkler system shall be installed throughout existing one- and two-family dwellings with additions when the sum of the total floor area of the addition plus the existing one- and two-family dwelling is increased to 4,800 sq. ft. or greater. The floor area of detached structures having floor areas of 120 square feet or greater that are located less than 50 feet from the dwelling shall be included in the floor area calculated for the dwelling.

Exception: One-time additions not exceeding 200 square feet in floor area.

R313.2.2 Remodels/renovations to existing one- and two-family dwellings. An automatic residential fire sprinkler system shall be installed throughout existing one- and two-family dwellings with a floor area of 4,800 sq. ft. or greater where renovations or remodeling work for which a building permit is required takes place in more than 50% of the area within the structure.

R313.2.3 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D. Systems shall be installed with a fire department connection (FDC) and other associated devices when required by the fire code official.

Residential Fire Sprinkler Requirements in Boulder County

History

Boulder County's residential sprinkler requirements have been in place since January 1, 1995. At that time, there was a concern that a large number of relatively large dwellings were being constructed in the unincorporated area of the county, an area served by up to 25 volunteer fire departments.

Response Times

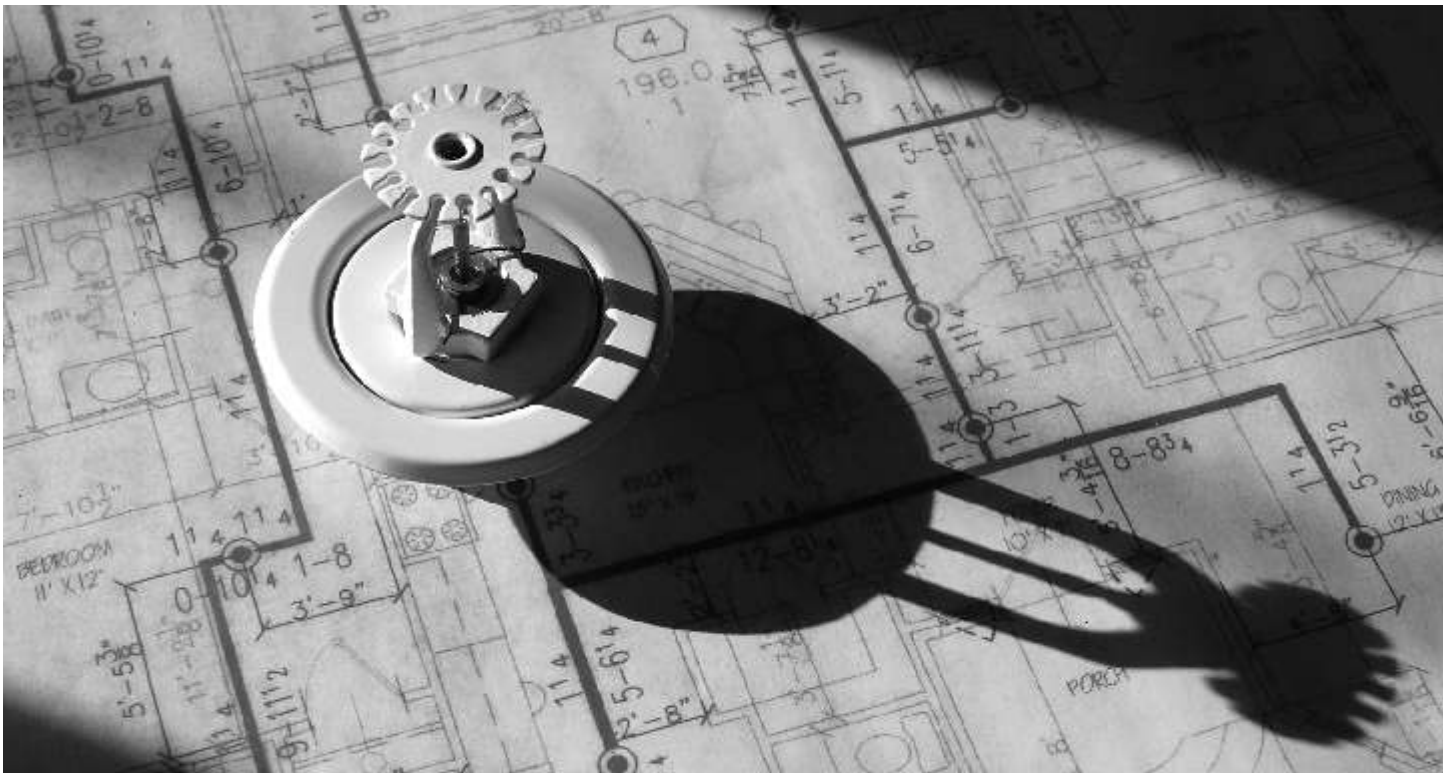
When notified of a fire, volunteer fire fighters need to first leave wherever they might be at the time, travel to the nearest fire station and pick up the fire equipment. It is only then that they can proceed to the scene of the fire. Where urban fire departments often have response times on the order of 4–5 minutes, response times for rural volunteer fire departments are often much longer. Both response times and firefighting efficiency can also be adversely impacted by distances, road conditions and the lack of adequate firefighting water supplies in rural areas.

Level of Service Issues

Residential fire sprinklers are most often promoted for life safety purposes. Sprinklers can either extinguish or contain a fire long enough for the occupants to safely exit the home before being overcome by smoke, heat or flames. In this case, the need for sprinklers is also seen as a "level of service" issue. A fire sprinkler system can give the volunteer fire department the time they need to arrive upon the scene and, hopefully, save the structure. In addition, the sprinkler system can prevent the fire from spreading to adjacent forests or grasslands or other homes.

Fire Sprinkler Operation

If a fire starts in a home, typically in the kitchen, in a wastebasket or on a couch or chair, the nearest fire sprinkler head activates as soon as the temperature at the head exceeds its design rating. For residential sprinklers, this is typically 155 degrees Fahrenheit (155°F.). An additional head will not activate until the temperature at that head also exceeds 155o. Most residential fires are extinguished or contained by the operation of one or two heads. The two most remote sprinkler heads are required to have a total flow of 26 gallons per minute for a duration of at least ten minutes. Residential fire sprinkler system water supplies are permitted to be part of the domestic water supply system, the same piping system that supplies showers, sinks, toilets and tubs.

Costs

In studies from various sources, the costs for installing sprinklers average about $1.50 per sprinklered square foot for new dwellings and range from $2.50 - $5.00 per square foot for retrofitting sprinklers in existing dwellings. The studies also report that home fire insurance premium reductions of between 5% and 15% are available when fire sprinkler systems are installed.