



DEPARTMENT OF ADMINISTRATIVE SERVICES

PROPOSED CHANGE OF THE CONNECTICUT STATE  
BUILDING CODE AND FIRE SAFETY CODE

DATE SUBMITTED: 8/8/2017

**CODE INFORMATION**

Proposed change to: ☒ Building Code ☐ Fire Safety Code

Code section(s): IRC R313.1, R313.1.1

**PROPONENT INFORMATION**

Name: Keith Flood

Representing: West Haven Fire Dept.

Telephone: 203-937-3710

Email: kflood@westhavenfiredept.com

Address: 366 Elm Street

West Haven

CT

06516

*Street Address*

*Town*

*State*

*Zip Code*

**PROPOSAL INFORMATION**

Description of change and reason for change (attach additional information as needed):

Reinstate International Residential Code requirement for fire sprinklers in new townhouses

Proposed text change, addition or deletion (attach additional information as needed):

Delete Connecticut amendments to IRC R313.1 and R313.1.1

Supporting data and documents (attach additional information as needed)

☐ **This Proposal is original material.** (Note: Original material is considered to be the submitter's own idea based on or as a result of his/her own experience, thought or research and, to the best of his/her knowledge, is not copied from another source.)

☒ **This Comment is not original material, its source (if known) is as follows:** (such as material / code development proposal from a prior development cycle or proposal submitted to model code committee etc.)  
Reinstating model code text

☒ **I would like to make an in-person presentation of my proposal.**

**Release**

I hereby grant the State of Connecticut full rights to the use of this material without benefit to me, including, but not limited to, publication and reproduction rights.

Proponent's Signature

Keith Flood

Printed Name

PLEASE EMAIL (PREFERRED) TO [DAS.CodesStandards@CT.GOV](mailto:DAS.CodesStandards@CT.GOV) OR MAIL OR FAX (SEE BELOW)

*Department of Administrative Services  
Office of the State Building Inspector  
450 Columbus Boulevard, Suite 1303  
Hartford, CT 06103  
Tel: 860-713-5900 Fax: 860-713-7410  
Affirmative Action/Equal Opportunity Employer*

12/29/16

## STATEMENT OF PROBLEM AND SUBSTANTIATION FOR PROPOSAL:

This proposal recognizes that there are two distinct topics covered by Section R313, townhouses in R313.1 and one/two-family dwellings in R313.2. Current and prior proposals related to amending R313 have lumped townhouses and one/two-family dwellings into a singular discussion, failing to account for unique safety risks and cost incentives that differentiate townhouses from other IRC dwellings.

Accordingly, this proposal offers a basis to separately consider townhouse sprinklers and recommends reinstating Section 313.1 in the Connecticut Residential Code to align with the IRC's national model requirement for newly constructed townhouses to be equipped with sprinklers.

**Increased fire risk associated with multifamily occupancy structures:** Unlike detached homes, where an owner has direct control over personal safety, townhouses are multifamily structures that include many unrelated individuals and families living under a single roof. In a townhouse, the fire safety of every family is reliant on the behaviors of others, i.e. a neighbor's carelessness or misfortune directly impacts the fire safety of other individuals, families, pets (who may be home unattended when a fire occurs) and property in the building. Many incidents are documented showing a fire in one townhouse yielding catastrophic consequences on neighbors who had nothing to do with the cause of the fire (Google search "townhouse fire"). Residential fire sprinklers prevent such tragedies by keeping fires contained to the unit of origin, either controlling the fire or extinguishing it altogether.

It is also worth noting that the National Fire Incident Reporting System codes townhouses as multifamily occupancies, separate from one- and two-family dwellings and recognizing that the risk associated with a townhouse fires is that of a multifamily occupancy.

**Increased risk to firefighters and demand on fire service resources:** Townhouses also place significantly increased demand on fire service resources as compared to detached dwellings. Townhouses increase the complexity of rescue operations, and firefighting is hampered because fire spread into adjacent units cannot be easily followed by firefighters from unit to unit. There are no access openings in party walls allowing firefighters to pass back and forth between opposite sides when fighting a fire.

**Parity with the Connecticut Building Code:** Section 903.2.8 of the Connecticut Building Code requires all townhouses built under that code to be sprinklered. If townhouses built to the Connecticut Building Code can be sprinklered, and there have been no objections to this requirement, why should IRC based townhouses not be provided with the same level of protection? There is no technical basis for requiring fire sprinklers to be installed under the Building Code yet exempt the same requirement under the Residential Code. This proposal provides equal protection to all townhouse residents, regardless of which code they are built under.

**Increased Danger of Residential Fire Behavior:** Research conducted by the National Institute of Standards and Technology and Underwriters Laboratories on residential fire behavior and the value of residential fire sprinklers to firefighter and occupant safety provides a technical basis for this recommendation. Research shows that the rate of fire growth in modern residential structures has increased, partly attributed to an increased heat release rate and an increased heat



of combustion associated with modern synthetic materials used in household goods and furnishings. Faster fire growth in a multifamily structure means that occupants of adjacent units will be endangered more quickly than was the case with legacy furnishings. Bear in mind that smoke alarms only alert occupants in the unit of origin. If that unit is unoccupied at the time of a fire, no one may be aware of a fire in the building until the fire breaks out of the unit.

**Support by the Building Industry for Townhouse Sprinklers:** It is important to note that the original proponent of the IRC requirement for townhouses to have fire sprinklers was NOT a fire service or public safety interest group. The proposal was submitted by a major national multifamily builder, Avalon Bay Communities. This builder recognized that the cost of providing fire sprinklers in townhouses could be recaptured through the reduced cost of fire separations between units and other incentives offered by the code, and with no significant cost impact (or perhaps even a cost savings), model code writers agreed that it simply made sense for all townhouses to have the protection of a residential fire sprinkler system.

**Financial Impact of Townhouse Sprinklers Cannot be Equated to One- and Two-family Dwellings:** From a financial perspective, arguments often conveyed by the building industry in opposition to residential sprinklers based on possible cost implications aren't relevant to townhouses because sprinklered townhouses can actually be less expensive to build than non-sprinklered townhouses. The difference is attributed to incentives that are offered by the IRC and the International Fire Code (IFC) for sprinklered properties.

There's no better testament to this cost comparison than the fact that the IRC's townhouse sprinkler requirement was proposed (RB66-07/08) by a major national multifamily builder, Avalon Bay Communities, not the fire service or public safety interest group. Prior to the 2009 edition, the IRC didn't include an allowance to reduce the fire rating of townhouse separation walls from 2-hours to 1-hour, which had been permitted by the IBC. Avalon Bay Communities proposed adding the IBC wall reduction to the IRC with the quid pro quo of also adding the IBC's requirement to sprinkler all townhouses. Avalon Bay Communities knew that the cost savings associated with the reduced wall rating alone typically equaled or exceeded the cost of installing sprinklers. When combined with other incentives offered by the IFC for access roads and water supply, the company knew that they could actually save money by sprinklering townhouses. Today, the financial incentives are even more rewarding because the recent IRC requirement for basement ceiling assemblies to be protected by a fire-rated membrane or equivalent construction is waived when fire sprinklers are installed.

Estimations of the net cost impact of a townhouse sprinkler requirement based on Connecticut construction costs are attached.

**Established Precedence:** The requirement to install fire sprinklers in townhouses, first published in the 2009 IRC, has been retained in the 2012, 2015 and 2018 editions and has now been adopted by 10 states (California, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, Oklahoma, Pennsylvania, West Virginia and Wisconsin) plus Washington D.C. and many local jurisdictions. In the State of Maryland, which has required sprinklers in all townhouses since 1989, and other jurisdictions that have since followed, there is no documented evidence of negative impacts on the townhouse market or home affordability associated with this requirement.

## Model townhouse cost comparisons

### Connecticut 066xx zip code (1.1 modifier over national average cost)

Stories	3	3	3
Total Area per Townhouse (sqft)	1,800	1,800	1,800
Units per building	5	5	5
<b>Construction Savings</b>			
Separation wall reduction from 2-hour to 1-hour	\$15,637.05	\$15,637.05	\$15,637.05
Basement ceiling	\$1,193.94	\$1,193.94	\$1,193.94
Total	\$16,830.99	\$16,830.99	\$16,830.99
Sprinkler Cost	\$13,365.00	\$16,830.00	\$24,750.00
Based on \$/sqft	\$1.35	\$1.70	\$2.50
Net cost per building	\$3,465.99	(\$0.99)	(\$7919.01)
Savings (cost) per townhouse	\$693.20	(\$0.20)	(\$1,583.80)
Savings (cost) per sqft	\$0.39	(\$0.00)	(\$0.88)

The \$1.35/sqft sprinkler cost is based on an NFPA report on the national average sprinkler cost for new single family home construction <http://www.nfpa.org/news-and-research/news-and-media/press-room/news-releases/2013/cost-of-installing-residential-fire-sprinklers-averages-135-per-square-foot>. Note that townhouse installations tend to be less expensive than single family based on repeat floor plans and economy of scale of multiple dwellings per building and per project in multi-building developments.

The \$1.70/sqft sprinkler cost was derived by iterative analysis to identify the break-even sprinkler cost, yielding a net zero when wall and ceiling construction savings are applied.

The \$2.50/sqft sprinkler cost was selected as a "high" cost vs. mature markets with a competitive supply of licensed installers. As more installations occur, it is expected that an increasing number of contractors will become available, which will reduce costs. Declining installation costs have been documented in California and were reflected in the NFPA 2013 report, cited above, vs. NFPA's initial cost study in 2008, which documented a national average cost of \$1.61.