

A Discussion Guide on the New International Residential Code Requirement for Residential Fire Sprinklers

Q: What happened in Minneapolis with respect to residential sprinklers?

A: Two code change proposals, RB66-07/08 and RB64-07/08 were approved by the International Code Council membership modifying the next edition of the International Residential Code by requiring fire sprinklers in new homes. One of these changes, RB66, will require all new townhouses to be equipped with fire sprinklers upon adoption of the code. The other change, RB64, will require all new one- and two-family dwellings to be equipped with fire sprinklers effective January 1, 2011.

Q: What is the International Code Council?

A: The International Code Council is a non-profit association that develops model code documents, including the International Building Code, International Fire Code and the International Residential Code, among others. These codes are the predominant building and fire safety regulations adopted by jurisdictions in the United States.

Q: What's a model code?

A: The United States is unique among major industrialized nations in the world with respect to building and fire safety codes. While these codes are developed and maintained by a national government body in most countries, the United States relies on consensus code-development processes run by non-profit associations to develop building and fire safety codes. States and local jurisdictions are not obliged to adopt these model codes, but most do because model codes help to standardize building and fire safety regulations over large geographic regions and because these codes relieve jurisdictions from the burden of managing an ongoing code-update process.

Q: What is the International Residential Code?

A: The International Residential Code (IRC) is the model code published by the International Code Council to govern construction of one- and two-family dwellings and townhouses not exceeding three stories in height. The IRC is adopted in 48 states, plus the District of Columbia, either statewide or by one or more local jurisdictions. California and Wisconsin do not currently use this code.

Q: When the 2009 IRC is published, will the sprinkler requirement automatically become law in the states where the IRC is used?

A: No, the IRC itself is merely a model code document. It does not become law in any jurisdiction until it is subjected to an adoption process, which varies among jurisdictions. The sprinkler requirement will likely be controversial in many jurisdictions, as it was at the national level in the IRC process, and it is anticipated that local home builder associations will lobby regulators in an effort to have the sprinkler requirement excluded when the 2009 IRC is adopted. Fire safety advocates will counter that the sprinkler requirement should be kept in the code. Ultimately, the decision to adopt or not adopt the sprinkler requirement will rest with the jurisdiction's administrative or legislative body charged with adoption of the new code.

Q: Is the IRC the first model code to require sprinklers in residential occupancies?

A: No. Actually, it's the last U.S. model construction code to add this requirement. In the U.S., there are two "families" of model codes made available for jurisdictions to adopt. One family of codes is published by the National Fire Protection Association (NFPA), and the other is published by the International Code Council. The NFPA building and life safety codes added a requirement to provide fire sprinklers in all new homes in the 2006 editions of these codes. On the International Code side, the International Building Code (IBC) added a requirement to provide fire sprinklers in all new residential occupancies governed by that code in the 2003 edition. This requirement impacted condominiums, apartments, hotels and some townhouses. Townhouses not exceeding three stories in height and one- and two-family dwellings were not impacted because these occupancies are not governed by the IBC. Instead, construction of these occupancies is governed by the IRC.

Q: Will the new fire sprinkler requirement affect homes that are remodeled or additions to existing homes?

A: No. The change specifically excludes remodeling and additions to existing homes. These limitations were provided in recognition of the extreme hardship that might be incurred in having to replace the water supply for an existing structure that was not initially designed to contain fire sprinklers. Although home fire sprinklers do not require a large volume of water to operate, the demand may exceed the capacity of the water service to an existing home.

Q: With the housing market experiencing the greatest decline in decades, isn't it the wrong time to be adding new mandates?

A: The International Residential Code sprinkler requirement for one- and two-family dwellings contains an effective date of January 1, 2011, which provides time for the housing market to recover before taking effect.

Q: Will the new sprinkler requirement increase the cost of new homes?

A: Perhaps, but the cost impact is likely to be nominal. The price of a new home is typically established based on the strength or weakness of a local housing market and the balance of supply and demand, rather than construction costs. Recent market statistics demonstrate this quite clearly. Just a few years ago, soaring demand caused home prices to increase far faster than the rate of inflation or material costs. Now, home prices are generally declining even though material costs are increasing. Builders must adjust sales prices to remain competitive with existing housing stock.

In mature markets, the builder's cost for a fire sprinkler system will be less than cosmetic enhancements, such as granite counter tops, or upgraded carpeting. One source of mature cost data associated with residential sprinklers is Scottsdale, Arizona. Scottsdale, which became one of the first major U.S. jurisdictions to require residential sprinklers, roughly 20 years ago, has documented their sprinkler system costs as being in the range of \$0.55 to \$0.75 per square foot. Today, Scottsdale has more than 40,000 sprinklered homes.

Q: The IRC currently has an appendix, Appendix P, which gives local jurisdictions an option to require fire sprinklers by adopting this appendix if they so choose. Why was it necessary to put the sprinkler requirement into the main code rather than just leaving it as an optional appendix?

A: The International Code Council's code development process involves the participation of building and fire safety experts and other affected interests from across the United States, and these parties deliberate the appropriate regulations to include in ICC's model codes. While many people regard the role of model construction codes to be an absolute minimum requirement, these codes are more appropriately regarded as the "model" regulations for safe buildings. Considering that roughly 8 out of 10 residential fire deaths occur in unsprinklered homes, the ICC membership determined that their model residential construction code, the IRC, should now recommend fire sprinklers as a standard feature in all new homes.

This action also recognizes that there is no premise for the IRC to promote residential fire safety on community-by-community basis, as opposed to promoting safety and regulatory consistency among all jurisdictions. No other ICC code has sprinkler requirements or residential fire safety as a local choice to be made at the time of code adoption, and now the IRC is consistent with ICC's other codes in this regard.

Q: Is the residential fire problem limited to older homes?

A: According to a recent HUD study, the median age of homes in the U.S. is 32 years. With this in mind, it makes perfect sense that more fires and fire deaths occur in "older" homes, simply because there are many more of them. However, the residential fire problem is certainly not limited to older homes, and it has not been directly correlated with home age. Given that most residential fire fatalities are associated with ignition scenarios related to human behavior, which are independent of home age, it is clear that home age is not well correlated with fire risk. In addition, fire growth in a home is largely dependent on contents, not the structure itself, and contents are independent of home age.

Q: Aren't smoke alarms enough to provide a fire safe environment?

A: Some home builders claim that smoke alarms are good enough to protect the public and that residential sprinklers aren't justified. Without question, smoke alarms save lives and they are largely responsible for the dramatic reduction in U.S. fire deaths over the past 30 years. Nevertheless, smoke alarms are only basic life-safety devices. On their own, they do nothing to stop the spread of fire, protect property or protect firefighters.

As smoke alarms age, their reliability declines. This concern prompted the National Fire Protection Association to require a 10-year replacement cycle for these devices in their NFPA 72 standard. Two difficult questions to answer are how many alarms will actually be replaced at 10-year intervals, and what will happen to the reliability of alarms that are not replaced? Although an estimated 96% of U.S. homes with telephones now have at least one smoke alarm, in 1/4 of reported fires in smoke alarm equipped homes, the devices didn't work. Another

study revealed that a surprising 34% of fire deaths in one- and two-family dwellings during the 2000-2004 period occurred in homes with a working smoke alarm. Perhaps this statistic correlates with the fact that fire death rates for the young and the elderly, those who are least likely to be capable of self-preservation even if they are awakened by a smoke alarm, are roughly double those for individuals in the central age group. Smoke alarms are good, but they can only go so far in reducing the nation's fire death and injury rates. We need residential sprinklers to complete the home fire safety package.

Q: Does the IRC offer any incentives for the installation of fire sprinkler systems in dwellings?

A: Incentives are not included in the 2009 edition of the IRC. A cooperative effort between representatives of the International Association of Fire Chiefs (IAFC) and the National Association of Home Builders (NAHB) in 2007 did result in an incentive package, which became Proposal RB67-07/08, but this proposal was unsuccessful in the ICC process. The package recognized the enhanced safety provided by residential fire sprinkler systems and recommended reductions in permissible property line separations and a variety of other fire-related code requirements in the IRC to help offset the cost of adding sprinklers and permit more design flexibility for new homes. Unfortunately, this proposal was defeated when home builders who represent the National Association of Home Builders on the International Code Council's Residential Building Committee attacked the proposal at a public hearing in February 2008. The tactic of attacking the incentive proposal appeared to be part of an overall strategy by NAHB at the time to deflect any mention of fire sprinklers in the main body of the IRC.

Some code official groups subsequently re-proposed two parts of RB67 in a public comment for consideration at the Minneapolis hearing, but the IAFC decided to withdraw the entire proposal because the public comment lacked the comprehensive approach that was intended in the original submittal. In withdrawing RB67, the President of IAFC stated in testimony that the IAFC would empanel a special committee to study the issue of residential sprinkler incentives and develop a model recommendation that would be made available to jurisdictions considering adoption of the 2009 IRC.

Q: Is an engineer required to design a home fire sprinkler system?

A: No. Home fire sprinkler systems utilize a very simple design approach that requires a water supply capable of delivering adequate water to operate one or two flowing sprinklers. A cooperative effort by the National Association of Home Builders and the International Association of Fire Chiefs in 2007 resulted in Proposal RP3-07/08, which adds a new prescriptive design approach to Section P2904 to the IRC plumbing provisions. Proposal RP3 was approved by the ICC membership for inclusion in the 2009 IRC. The approach is a "cook book" methodology that involves selecting numbers from a series of tables to identify the required pipe size for supplying fire sprinklers. Engineered systems are still permitted to be used to improve efficiency in design or provide solutions for installations on low-pressure municipal water supplies. The approach is similar

to structural design under the IRC, where span tables can be used to provide a conservative structural design and engineered solutions are permitted as an alternative.

Q: Some people are claiming that the fire service “packed” the Minneapolis hearing to win the vote. Why is this claim being made?

A: The number of ICC voting governmental representatives who came to the Minneapolis code hearing to vote on the residential sprinkler issue was unprecedented in history. The level of interest in this issue was not surprising given that fire-safety advocates consider the residential sprinkler requirement to be one of the most important code changes in the history of model codes and that the National Association of Home Builders is vehemently opposed to this change.

Participation at the hearing was bolstered by two programs that were offered to provide travel assistance to ICC members, one by the IRC Fire Sprinkler Coalition, and one by the National Association of Home Builders. The IRC Fire Sprinkler Coalition program, conducted on behalf of more than 100 international, national and local public safety interest groups, offered assistance to governmental representatives who would not otherwise be able to afford to attend. The IRC Fire Sprinkler Coalition’s program was initiated in direct response to a funding program launched by the National Association of Home Builders in 2007 ([CLICK HERE](#) for documentation) and repeated in 2008 ([CLICK HERE](#) for documentation) to bolster code official attendance at ICC hearings. The idea of sponsored travel was initially NAHB’s, not the IRC Fire Sprinkler Coalition’s.

Nevertheless, unlike the NAHB program, which advertised funding availability only for sprinkler opponents ([CLICK HERE](#) for an example document), the IRC Fire Sprinkler Coalition’s program did not discriminate based on the voting preference of the applicant. Also, unlike the NAHB program, the IRC Fire Sprinkler Coalition program did not distribute any funds directly to travelers, instead opting to pay for airfare and hotel expenses directly to the travel vendors to avoid any potential for personal gain by participants. These and other safeguards were put into place for the Coalition’s program to ensure that the program was both legal and ethical ([CLICK HERE](#) to review legal opinion).

In the end, the outcome of the vote was a reflection of the commitment of those who were willing to sacrifice their personal time to travel to Minneapolis, attend a weekend hearing and participate in the final vote.