



Fire Sprinkler Retrofit Guide

Understanding Fire Sprinkler
Installation Criteria in the
Retrofitting of Fraternity and Sorority Houses

Fire Sprinkler Retrofit Guide

Understand The Importance of Fire Sprinklers

Fire Sprinklers Save Lives And Money

Our nation's Fire Chiefs have long recognized the significant importance of automatic fire sprinklers. For decades, automatic fire sprinklers have maintained an impressive 97+% effectiveness in controlling fires in large manufacturing plants, hospitals, and storage facilities. However, each year 80% of our nation's fire deaths occur in residential settings. During the past 15 years and at the insistence of our nation's fire service community, fire sprinkler technology has developed an affordable residential fire sprinkler system. While practically any change brings out many "naysayers," many fire sprinkler system myths assumed by the public have created a barrier of misunderstanding. For example, movies and television typically and erroneously show fire sprinkler systems completely flooding the interior of buildings. The truth is that each fire sprinkler operates independently from others when heat, in a residential setting, reaches 155⁰F - 165⁰F. The truth is that two or less fire sprinklers control over 90% of fires in sprinklered residential buildings. The following points are presented to improve one's understanding of fire sprinkler systems and to counter the many myths that cloud a true understanding of fire sprinkler systems:

- Each sprinkler operates individually from other sprinklers.
 - Loss records of Factory Mutual Research indicate that the probability of a sprinkler discharging accidentally due to a manufacturing defect is only 1 in 16,000,000. A person has a better chance of winning the lottery than a sprinkler does of accidentally discharging.
 - A National Institute for Science and Technology study reports that there will be a 82% reduction in fire deaths if fire sprinklers are included with smoke detectors in residential occupancies.
 - Key contributing factors in fire deaths are: Building Materials Used in Construction, Alcohol, Smoking, Interior Finish, and Physical Impairment.
 - Aside from fire fighter and explosion fatalities, there has never been a multiple loss of life (3 or more people) in a fully sprinklered building due to fire or smoke.
 - Smoke detectors do not control fires; fire sprinklers control fires and slow or stop the production of lethal smoke and toxic fire gases.
 - Sprinklers are affordable.
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Step 2

Fire Sprinkler Retrofit Guide

The Fire Sprinkler Specification and Bid Process

Picking The Least Cost Fire Sprinkler Design Standard

There are three fire sprinkler design standards that may be applied during fire sprinkler retrofit or installing a new fire sprinkler system in a fraternity/sorority house. The National Fire Protection Association (NFPA) pamphlet 13 is the fire sprinkler design standard used for fire sprinkler installations in most commercial buildings. This standard may also be used for fire sprinkler design criteria when the installation is in a fraternity/sorority house. The standard requires water flow of not less than four fire sprinklers and may impose additional water flow if large places of assembly exist within the property. The NFPA 13 fire sprinkler design standard requires the installation of fire sprinklers in attics and other unoccupied spaces where fires rarely originate. Compliance with the NFPA 13 standard is the most costly of the three fire sprinkler design standards.

A fire sprinkler design standard has been developed specifically for residential occupancies that are four and less stories in height. The NFPA 13R fire sprinkler design standard does not require fire sprinklers in unoccupied spaces and allows design criteria up to four fire sprinklers. If the largest room can be protected with less than four fire sprinklers (400 sq. ft. each maximum coverage), then the water supply needed can be reduced to the lesser requirement which means smaller pipe and lower costs. NFPA 13R fire sprinkler design standards is the document that should be used for the vast majority of fire sprinkler retrofit in fraternity/sorority houses. Application of NFPA 13R is less costly than the NFPA 13 design standard.

There also exists an NFPA 13D fire sprinkler design standard, the least costly of all, which is designed for one- and two-family dwellings. While some fraternity/sorority houses may have been originally classified as a single-family home, fire codes are applied based upon how a building is being used, not how it was originally constructed. Most fire officials will classify a fraternity/sorority house as a rooming and lodging facility and may be reluctant to allow the use of a fire sprinkler design standard developed for single-family properties. The NFPA 13D design calls for water supply to feed up to two fire sprinklers, a criterion that should not be applied in the typical fraternity/sorority house.

You need to specify that your fire sprinkler system be designed using the least cost fire sprinkler design standard which typically will be the criteria found in NFPA 13R. If NFPA 13R cannot be used, investigate why not. Ask for an outline of fire sprinkler costs to include impact fees, connection fees, plans review fees, and any other fee that may be increasing the cost of the system. Feel free to ask the local government for a waiver of impact and other fees that may be increasing the cost of the system. And, ask the contractor to include inspecting, testing, and maintenance for at least two years as part of the bid package.

Step 3

Fire Sprinkler Retrofit Guide

Identify Reputable Fire Sprinkler Contractors

The National Fire Sprinkler Association Membership

Members of the National Fire Sprinkler Association were so distressed by the needless loss of life in a fraternity house fire at Chapel Hill, North Carolina that it established a Retrofit Task Force with the mission of providing technical resources to facilitate fraternity/sorority house fire sprinkler retrofit. Many contractors within our nation's fire sprinkler industry have donated much time and effort to aid fraternity/sorority leadership in determining fire sprinkler installation criteria. The Task Force polled the membership of the National Fire Sprinkler Association (NFSA) and determined that many members have historic ties to fraternities and sororities. The members of NFSA are available to help and assist fraternity/sorority leadership by providing free cost estimates.

By contacting the NFSA at 1-800-683-NFSA, one can obtain a list of members that regularly do business in your area of the country. We recommend that three separate companies be afforded the opportunity to bid your retrofit project. Also, on our website, www.NFSA.org, you may search for contractors by selecting Members, then Contractors, then select your state to identify fire sprinkler contractors. The fire sprinkler industry, when compared to other construction trades such as plumbing and electrical, is very small. Accordingly, it is common for contractors to bid work outside their city of residence.

The NFSA has Regional Managers covering the entire nation. These Regional Managers have the expertise and experience in dealing with governmental officials on fire sprinkler related issues, as all have extensive fire service experience. The NFSA staff should prove to be a valuable resource in addressing excessive impact fees and the many externalities that increase the cost of fire sprinklers. The contact for identifying the appropriate regional manager is:

Buddy Dewar, Director of Regional Operations
National Fire Sprinkler Association
200 West College Avenue
Tallahassee, FL 32301
(850) 222-2070 Fax (850) 222-1752 Dewar@NFSA.org

Buddy is the former Director of Florida's State Fire Marshal's Office and is nationally recognized as a fire safety expert. Through the NFSA Regional Manager network, the Greek Housing Advisor can obtain valuable guidance and assistance in dealing with complex fire safety issues that are typical with older housing. The Regional Manager network has acted as a "second opinion" on fire safety issues impacting Greek Housing, which has resulted in significant cost savings.

Step 4

Fire Sprinkler Retrofit Guide

Reviewing and Accepting Bids

Understanding Bid Differences

There are a number of different ways to install a fire sprinkler system. The NFPA fire sprinkler design standards require a specific gallon per minute flow of water over a specific area for residential occupancies. Fire sprinkler contractors must design and install fire sprinkler systems based upon the national standards. Accordingly, the end result of fire control and suppression will occur regardless of the fire sprinkler layout design.

An example to help you understand this dilemma, one fire sprinkler contractor may bid a project that will result in exposed pipes in rooms and corridors while another contractor may bid an installation that has piping concealed in the ceilings and walls. Obviously the exposed pipe installation will be lower cost. If you intend to conceal the piping, the cost of drywall, dropped ceilings, or other concealing methods added to the fire sprinkler installation costs may exceed the cost of installing the system with concealed pipes. Another low cost option would be the use of prefabricated Soffi-Steel™ pipe concealing systems. Take time to understand what the differences are between bids.

As mentioned earlier, many costs external to the fire sprinkler installation costs may make differences in bid packages. One contractor may include the cost of installing a device intended to protect a municipal water supply known as a backflow preventor. Some jurisdictions will require a backflow preventor while others do not. A jurisdiction may require a backflow preventor and the contractor may have left the requirement out of the bid package. You may wish to determine if backflow preventors are required by your local jurisdiction. If the fire sprinkler system uses plastic pipe and is maintained on a regular basis, the backflow preventor will be of little to no value. In another example, a contractor's bid may include the cost of tapping an additional line to the city water main while a competing bid may indicate tapping on the domestic side of the water meter. The cost of the additional tap often doubles the cost of the NFPA 13R designed fire sprinkler system. If the fire sprinkler system can be hydraulically calculated to perform by using existing water supplies and water main taps, by all means take advantage of this cost savings. Local fire code enforcement officials are responsible to review the hydraulic calculations to verify that the existing water supply is appropriate to meet the fire sprinkler system needs.

Some political jurisdictions may impose an impact fee. There is no impact or additional costs imposed on local government as a result of the installation of a fire sprinkler system. New construction may add to government's infrastructure costs but the impact of an existing building has already occurred. Fire sprinklers reduce government's fire suppression expenditures. If you should be faced with what appears to be excessive barriers and costs to installing fire sprinklers in existing fraternity/sorority houses, please contact Buddy Dewar, whose address and telephone number is listed herein. After review, select the best bid and go forward with the retrofit installation.

Step 5

Sprinkler Retrofit Guide

Obtaining Insurance Credit For Fire Sprinkler Protection

Insurance Savings Can Pay For Fire Sprinkler Installation

There could be a substantial insurance savings achieved by adding a fire sprinkler system to an existing Greek house. One fraternity located at the University of California at Berkeley recently analyzed insurance savings. The cost per \$100.00 insured property went from \$0.694 to \$0.450 after the fire sprinkler system was installed, or an annual savings of \$3,654.00 in insurance payments. Insurance savings in typical fraternity house is usually twice that expected in the typical sorority house because of differing risk factors.

Insurance savings are not automatically applied to fire sprinklered property. One typically requests an insurance reduction once the property is equipped with a fire sprinkler system. Insurance companies typically ask for a copy of the design plans and specifications and the hydraulic calculations for its review before credit is applied. Some insurance companies allow less credit for NFPA 13R installations than they would allow for a NFPA 13 installation. Some insurance companies give no allowances for NFPA 13R designed fire sprinkler systems. Some states like Florida require by law that insurance companies apply credits for NFPA 13R systems. There are a number of insurance companies that allow substantial credit for NFPA 13R designed systems so shop around. Because of uncertainty, it may be advisable to identify insurance savings prior to making a determination on which fire sprinkler design is most cost effective for your property.

Insurance companies typically require a maintenance contract with a fire sprinkler company to ensure that the system for which you are receiving credit is operational. There exists one nationally recognized maintenance standard for fire sprinkler systems, NFPA 25. Maintenance contracts should be prepared such that the provisions of NFPA 25 are met. Maintenance contracts for the typical fraternity/sorority house will cost a few hundred dollars each year. To make maintenance of the fire sprinkler system even more affordable, existing fraternity/sorority house staff can perform some of the recurring inspections and tests thereby reducing the frequency of fire sprinkler contractor visits.

Also investigate income tax savings by taking advantage of depreciation allowances for the value of the system, which typically is 27.5 years for residential type occupancies. Also the interest on a loan used to retrofit the fire sprinkler system may be tax deductible. And, perhaps the greatest economic benefit of installing fire sprinkler systems is liability avoidance.

Please feel free to contact the National Fire Sprinkler Association with any questions you may have regarding the retrofit of fire sprinkler systems.