

Fire Suppression Systems in Historic Places of Worship

A small, localized fire in an historic house of worship takes only a few minutes to grow out of control making fire suppression equipment a critical need.

One of the most effective ways to control the spread of fire is to install an automatic sprinkler system. According to the National Fire Protection Association (NFPA), an automatic sprinkler system consists of a network of piping with sprinklers uniformly spaced along piping to provide protection to a specified area or building. Water is supplied to the piping from a supply system, such as a municipal or private water distribution system. Several types of automatic sprinkler systems are outlined below. These sprinkler systems should be designed by a fire protection engineer.

Traditionally, congregants of historic religious properties have been reluctant to install automatic sprinkler systems for fear of water damage during a fire. However, water damage that occurs is largely from the operation of the fire department's hose lines. Sprinklers minimize water damage by placing a specific amount of water directly on the seat of the fire. Another common misunderstanding about sprinkler systems is the belief that all of the sprinklers throughout the building are activated when a fire occurs, flooding the entire building. This is not true: only the sprinkler or sprinklers over the seat of the fire will activate. Statistics indicate that in a sprinklered building usually no more than four sprinklers are activated during a fire.

Wet-Pipe System

The NFPA defines a wet-pipe automatic sprinkler system as a permanently piped water system under pressure, using heat-actuated sprinklers. When a fire occurs, the sprinklers exposed to the high heat discharge water to control or extinguish the fire. It is commonly recommended that this is the most suitable type of suppression system available for a large and open type structure such as a religious property. An automatic wet-pipe sprinkler system can help reduce loss from fire and can provide additional functions:

- detect the fire at its point of origin
- sound an alarm
- control or extinguish the fire
- dispatch the fire department through the alarm system.

Dry-Pipe System

A dry-pipe automatic sprinkler is an alternative to the wet-pipe sprinkler system. It has heat operated sprinklers attached to a piping system; however, the piping contains pressurized air in lieu of water. When a sprinkler head is activated, the air pressure is reduced, a valve is opened by water pressure, and water flows to the opened sprinkler. A dry-pipe system is typically recommended for areas in buildings or entire buildings that are not heated and are therefore subject to freezing conditions.

Pre-Action System

A third type of sprinkler system is a pre-action system, which like a dry-pipe system, also contains air with a supplemental fire detection system installed in the same area as the sprinklers. If a heat or smoke detector indicates a fire, a valve automatically opens permitting water to flow into the piping to discharge from the sprinklers that have opened due to exposure to a heat source. This is generally installed in computer rooms and other high-tech areas in a building. A pre-action system is not installed throughout an entire building because of the cost.

Water-Mist System

Currently under development is a water-mist type sprinkler system. Fine divided water mist relies on relatively small droplet sprays to extinguish fires. The mist cools the fire creating steam thereby extinguishing the fire. Mist systems will use far less water than a standard sprinkler systems and the technology is still in the early stages of development.

Gaseous System

According to the NFPA, a gaseous or clean agent system is a permanently piped system using a limited, stored supply of gaseous extinguishant under pressure and discharge nozzles to totally flood an enclosed space.

There are various types of gaseous systems. Previously Halon gas was most frequently used. However, Halon has been found to be responsible for depletion of the ozone layer and is no longer manufactured. Other gases have been developed as alternatives to Halon. These alternate gaseous systems are generally used in confined areas such as vaults and high-tech areas.

Sprinkler Heads

There are many types, styles, and finishes of sprinkler heads available that can be installed to minimize the disturbance of the existing appearance of a facility -- many of which are undetectable by the human eye.

As an alternate method, the piping system that provides the water also has a large selection of choices available. Besides the standard steel or galvanized pipe, there is copper tubing and various types of plastic tubing approved for fire suppression

system use. These provide a great deal of flexibility in installation and can be cost-effective. Also available are prefabricated soffiting with a selection of finishes and colors that can be used when concealment of the piping is difficult or impossible.

An important aspect in the installation of any suppression system is that it should not damage, alter, or compromise the aesthetics of the existing facility. The fire protection engineer's design documents should be specific and detailed to address these critical issues and the contractor is made aware of this when preparing their bids.

Finding the funding for providing an automatic wet-pipe sprinkler system will obviously be difficult. However, once you have committed to providing a sprinkler system, it does not have to be installed overnight. Your institution is probably 100 years old or even older. Therefore, a sprinkler system installation time frame of 5 to 10 years is reasonable. Remember you did not have a sprinkler system for the first 100 years. What is critical is the end result - an automatic sprinkler system installed throughout your facility.