Fire Protection Planning: Priority or Afterthought?

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Developing specific plans for fire protection and integrating approving authorities into the early development stages of a building's design are increasingly viewed among the most effective ways of reducing unnecessary cost in building projects.

Although early fire protection planning is on the uptick, too often fire protection design is still an afterthought compared to other trades within a given project, despite its known benefits to life safety. Discovering difficult-to-navigate codes, standards, ordinances and authorities having jurisdiction (AHJs) late in the construction process often results in unnecessary, and sometimes show-stopping, expenditures. Fire suppression and alarm systems, fire protection water supply, life safety features and the approving authorities' knowledge and interpretation of the requirements for each should be both known and considered during project conception.

Dozens of factors could result in one or more fire protection systems being required. For example, storage of some plastic commodities more than 6 feet high in an area exceeding 500 square feet could result in not only the need for increased fire suppression, but also additional water volume to feed it, smoke and heat venting, draft curtains, smoke extraction and fire alarm systems that otherwise may not have been required.

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Another example would be the emergency voice communication systems required for buildings with an occupied floor greater than 75 feet above the lowest level of fire department access. Involving knowledgeable and qualified fire protection engineers and consultants in the conceptual phase will aid in planning, assist in reducing unexpected project costs, and will likely prove to be among the best-spent project dollars regardless of the building's occupancy, construction or use. This will be apparent throughout the construction process, especially on the date of occupancy.

FIRE SUPPRESSION

All fire suppression systems are not created equal. Whether they are water-based, wet chemical, clean agent, foam, dry chemical, carbon dioxide, or one of the many other possibilities, the options and resulting infrastructure requirements can be mind-boggling. Understanding the type of suppression that is required is only part of the battle. Once required protection systems are determined, many common mistakes typically ensue. These can include failure to consider infrastructure required for systems, failure to consider a particular occupancy use characteristic and failure to select appropriate protection criteria. Equally important as the overall building construction type, size and occupancy are the individual operations and processes that occur within the building as part of its use. A single operation can significantly change requirements for the needed suppression system.

WATER SUPPLY

For a multitude of reasons, water is the single most used extinguishing agent where fire suppression is required. In the fire protection engineering community, it is common to hear general contractors or architects say, "There is plenty of water pressure," and misleadingly indicate there is enough water flow (volume) and pressure for a suppression system and required onsite fire hydrants. Some of the missing factors that must be analyzed before that statement is confirmed from a fire protection perspective include reliability, distribution system operating parameters, back flow and metering requirements, just to name a few.

It also must be clearly understood that the water required for fire suppression systems and the water required for fire flow are entirely different. While both requirements will be expressed as a certain number of gallons per minute at a certain residual pressure, they are often two completely different amounts. In most jurisdictions, required fire flow can be as little as 1,000 gallons per minute or can eclipse 8,000 gallons per minute, depending on several factors. Regardless of whether sprinkler system installation is required, one of the most costly mistakes that can be made during a given project is beginning the design before fully understanding the water supply.

OTHER REQUIRED FIRE PROTECTION FEATURES

Understanding what will eventually take place within the building is paramount. Depending on the nature of the occupancy, a multitude of lesser-known but equally important fire protection features may be required. Some examples include standpipe systems, special purpose portable fire extinguishers, emergency voice communication, smoke control systems and explosion control. These are in addition to more commonly known features and could affect the need for additional sitework, changes to the building facade, wider or more robust roadways, radio repeaters, key boxes, roadway or building signage, etc. Recognizing the need for these items prior to construction aids in keeping overall project costs under control and eliminates or reduces the potential for costly change orders.

The question that must be asked is: "What is the exposure that can result from poor fire protection planning?" Delays during plan review are mere inconveniences compared to the eventual reality that something as substantial as an onsite water storage tank for suppression systems or increased fire hydrant flow will be required. All model codes have a variation of language that requires fire protection and life safety features to be in place and functional prior to a certificate (even a temporary certificate) of occupancy being issued.

The early and detailed involvement of a fire protection professional and approving authority during the development and planning stages of a building's design will pay dividends. Spending $10,000 during the planning phase could save some exponential multiple of that fee by ensuring the building being erected is safe for its occupants, will

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For more than 25 years, Marla has educated contractors, subcontractors, bankers, public and private owners, legislators, educators, insurers, and attorneys on contract surety bonding and construction issues. She's the author of more than 100 articles, including an award-winning series for the Risk Management Association, and has written books, directories, informational brochures, and reports. Her extensive construction and risk management background includes stints as executive director the American Subcontractors Association of Metro Washington and the Surety Information Office. She also worked for Associated General Contractors of America, National Conference of States on Building Codes & Standards, Association of Major City Building Officials, and National Concrete Masonry Association. She served on the boards of the Construction Writers Association, and American Council for Construction Education and was active in the Construction Owners Association of America.

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