

Case Study

BlazeMaster® Fire Sprinkler System answers prayers of residents in historic convent.

Type of Construction:
Historic Building

Installation Type:
Retrofit

Location:
Pittsburgh,
Pennsylvania

Scope of Project:
Heads: 1,600
Sq. Feet: 85,000
Stories: 4

Fire Sprinkler Contractor:
Ruthrauff, Inc.



In 1996, the Sisters of Mercy convent at Carlow College, near Pittsburgh, determined that a renovation was necessary to improve the convent's facilities and accommodate the changing needs of its residents and building codes.

Built in 1909 and recently designated as a historic landmark (Photo 1), the City of Pittsburgh required the 147,160 sq. ft. brick convent be retrofitted with a fire sprinkler system to protect the safety of its residents.

AMK Consulting was selected to oversee the renovation project. Time was of the essence – each part of the renovation project had to meet its deadline to allow the least disruption to the sisters.

“Since most of the convent's residents are elderly and remained in the building during the renovation, we had to make sure their lives were not interrupted by the construction,” said Alice M. Kulikowski, president of AMK.

Renovation Revelations

Of great concern to the convent and Carlow College, the renovation needed to maintain the integrity of the building's aesthetics and appearance. Thus, methods of concealing the new fire sprinkler pipe became a major challenge.

With approximately 425 core drilled wall penetrations and more than 300 ft. of channeling, the contractor had to utilize the 15-in. thick brick interior walls to conceal the CPVC fire sprinkler pipes (Photo 2). In many instances, the core drilled holes ran on an angle through the wall. When channeling walls, hidden structural I beams were found behind the wall's surface.

“This was such an unusual retrofit that required many design changes during installation,” said Karl Eidberger, project manager for Ruthrauff, Inc., the fire protection contractor for the job. “This is where BlazeMaster® CPVC pipe gave us the biggest advantage. Other materials would've required difficult, costly re-threading and cutting. By making all our changes on site, we were able to stick to the budget.”



Due to the superior hydraulic characteristics of BlazeMaster® CPVC pipe over Schedule 40 pipe, and ease of installation, Ruthrauff was able to prepare an appropriate design strategy, which employed typical pipe sizes throughout the convent. By deciding to implement the use of CPVC pipe early in the project, Ruthrauff was able to overcome any obstructions and problems that would have existed with a Schedule 40 steel pipe installation. This helped in the completion of the installation ahead of schedule.

BlazeMaster® CPVC Product Benefits

BlazeMaster® Fire Sprinkler Systems offer long-term reliability due to its corrosion resistance, low flame spread, low smoke emission levels and a 50-year life expectancy with a safety factor of 2. BlazeMaster® CPVC piping lasts much longer and requires less maintenance than metal piping systems. In particular, Ruthrauff recognized that only CPVC plastic pipe could be channeled through the angular walls.



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"When it came to field installation, staging of materials and on-site construction changes, CPVC pipe and fittings helped ease an otherwise difficult installation," said Tom Zarewicz, project foreman, Ruthrauff.

Because CPVC pipe is easy to fabricate in the field with simple tools, any necessary adjustments the Ruthrauff crew had to make were completed on the job site without difficulty or re-engineering. This allowed for a cleaner, quieter installation and less disruption of the convent.



Another special consideration was the convent's appealing archways (Photo 3). The distance between the archway and ceiling was limited, requiring the piping system to bend along the arch of the doorway. And, for aesthetic reasons, the fire sprinkler system had to be concealed. Steel piping systems would not be able to meet this requirement.

Because of its flexibility in design, BlazeMaster® CPVC pipe was also used to help the construction team make the fire sprinkler system connection to the new worship area (Photo 4), which featured open vaulted ceilings and a steel fire sprinkler system.



BlazeMaster® CPVC pipe was used in 85,000 sq. ft. of the building, where hazards did not mandate steel piping. In all, over 5,600 ft. of BlazeMaster® CPVC pipe, 2,800 fittings and nearly 1,600 sprinklers were employed for the building's fire sprinkler system.

Since CPVC pipe is lightweight and easy to work with, the installation of the system was much quicker than with steel systems. The ability to cut BlazeMaster® CPVC pipe on site to exact measurements, and then to cement fittings in tight places where not even the jaws of pipe wrenches would fit, helped Ruthrauff succeed in completing the project on time.

The renovation project, including the fire sprinkler system installation, was a success. The total renovation – from conception to completion – took place in three years. On behalf of the Sisters of Mercy nuns, the consulting company praised Ruthrauff for the speed and ease of the BlazeMaster® Fire Sprinkler System installation.

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