

## CASE STUDY



SCIENCE. SERVICE. SAFETY.

### PROJECT:

Three-Building Office Complex

### LOCATION:

Roseville, California

### INSTALLATION TYPE:

Retrofit

### CONSTRUCTION TYPE:

Wood Trusses

### SCOPE OF PROJECT:

24,000 sq ft

### BENEFIT:

Labor Savings of 35%

# BlazeMaster® CPVC Streamlines Commercial Building Retrofit

**It's a common myth that BlazeMaster® CPVC is limited to residential applications. Proving this assumption wrong, BlazeMaster provided the perfect solution for retrofitting a 24,000-square-foot commercial office building complex in Sacramento, California.**

The complex includes three light-hazard occupancy buildings connected by combustible breezeways that needed to be sprinklered. The 50-year-old structures had never had sprinklers installed, and local government was requiring them. After retrofitting the first building using steel piping, Alwest Fire Protection, the fire sprinkler contractor on the job, soon realized that BlazeMaster CPVC would be more cost-effective for the remaining two buildings.

"Since the ceiling had been removed, we assumed installing steel would be pretty easy," said Bill Norwood, President of Alwest. "However, we had to chop the steel pipe into eight-foot sections to fit into the trusses. If we could go back in time, we would have used CPVC on the first building too because it was so much faster."

Alwest has 25 years of experience in a wide range of projects, from custom homes to offices, remodels, wine caves and more. When he decided to switch the project to CPVC, he immediately thought of BlazeMaster CPVC because of an earlier successful project at a Sacramento marina. Norwood said he chose BlazeMaster CPVC specifically based on its excellent customer support team, its [comprehensive compatibility program](#), and its long track record of proven performance.

### Advantages of CPVC Over Steel

The two office buildings, totaling 16,000 square feet, required the installation of 240 sprinkler heads in combustible concealed spaces. By using BlazeMaster CPVC, Alwest reduced its labor by about 35 percent, Norwood said. He estimates that using CPVC instead of steel saved about 100 man-hours over the two buildings.

“Using CPVC was not top of mind for me prior to this project, but now I'll always consider BlazeMaster CPVC for future commercial retrofits as well as residential applications.”

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President,  
Alwest Fire Protection



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Overall, use of BlazeMaster CPVC saved the building owner \$21,000. Those cost savings will grow over time because CPVC doesn't corrode. Once corrosion starts in a steel system, "You repair it until it can't be repaired anymore, then you have to replace it," Norwood said.

Using BlazeMaster CPVC also resulted in minimal disruption to the buildings' tenants, as less cleanup was required at the end of the shifts. The work was done overnight, and crews needed to ensure the job site was cleaned up so a doctor's office in the building could start seeing patients in the morning. "With steel, there would have been much more cleanup required and equipment to relocate before the crews ended work for the night," Norwood said.

## How Alwest Did It – Six Tips for Success

### 1. Be proactive with AHJs

NFPA 13 permits the use of CPVC in light hazard occupancies, but some Authorities Having Jurisdiction (AHJs) may not be familiar with CPVC and incorrectly assume that it can only be installed in residential applications. Norwood said he overcame the initial resistance from the AHJ by making sure he covered all bases when submitting the plans. Then he kept the AHJ informed at each step of the way. "It's important to be proactive and get any potential concerns, such as compatibility, out on the table initially rather than waiting to get a question," Norwood said.

Making a good first impression at inspections was also important to building trust with the AHJ. "The glue joints looked spectacular for the inspection, and that helped overcome any skepticism," Norwood said.

### 2. Plan armovers precisely

When using CPVC, it is critical to know exactly where armovers will be placed. It is important to plan appropriately because you cannot saddle in an outlet or drop because it must be solvent welded.

### 3. Use no-block hangers to support the pipe

Alwest used no-block hangers with a two-screw stand-off to attach the hangers to wood trusses. This practice eliminated blocking to the beam when hanging the CPVC pipe. The hangers also act as a restraint when in close proximity to a drop.

"Overall, installation of hangers is much faster and simpler compared with 20 years ago," Norwood said, "The material cost of added hangers is not a significant issue," he added.

### 4. Consider specific application sprinkler heads

For this commercial project, Alwest used a specific application sprinkler head that was listed for use with BlazeMaster pipe and fitting system in a combustible concealed space requiring sprinklers. BlazeMaster pipe and fittings must never be installed in combustible concealed spaces requiring sprinklers, as referenced in NFPA 13, except when used with these specially listed sprinklers. NFPA 13R and 13D permit the omission of sprinklers from combustible concealed spaces and BlazeMaster pipe and fittings may be installed in these areas when sprinklering residential occupancies according to these standards.

Depending on the head brand and model, some combustible concealed space sprinklers may require draft curtains – fixed or automatically deployable barriers protruding from

the ceiling that contain or prevent the migration of smoke. Viking® and Tyco® offer sprinkler heads that, when designed and installed according to the specifications in their listings, eliminate the need for draft curtains.

However, for this retrofit the owner installed draft curtains where needed. This approach added cost, but overall CPVC pipe was still less expensive to install. Even with the draft curtains, the building owner saved \$21,000.

### 5. Use seismic restraints for CPVC, both laterally and longitudinally

Given California is subject to earthquakes, the fire sprinkler system had to be designed to meet NFPA 13 requirements that protect the pipe in the event of seismic activity. Alwest met seismic requirements using TOLCO™ bracing that attaches to the hanger. These braces are UL-approved for use with CPVC. “They are easy to install and were approved without any issues,” Norwood said. Meeting seismic requirements is no more difficult or expensive for CPVC pipe compared to steel.

### 6. Design for expansion and contraction

CPVC systems must be designed to allow for [expansion and contraction](#) of the pipe due to changes in temperature. With the majority of the BlazeMaster CPVC pipe being installed in a concealed space, Norwood knew to plan for this ahead of time.

Alwest addressed this primarily by using changes of direction. At the end of a run of pipe, the corner elbow and adjoining pipe allowed for some degree of movement. Ensuring the adjoining pipe was long enough allowed thermal expansion and contraction to be accounted for by placing a hanger or guide a defined distance away from the elbow. For the Sacramento project, if pipe changed direction more than 20 feet from the last change, Alwest made sure the hanger went over 24 inches after the 90° instead of the standard six inches.



This approach enabled Alwest to use only one expansion loop to address expansion and contraction. Expansion loops are U-shaped configurations placed in the middle of a run of pipe that allow pipe to move back and forth. Custom calculations of expansion loops, offsets and changes of directions [can be found here](#).

### BlazeMaster CPVC for Light-Hazard Commercial Retrofits

“Switching to BlazeMaster CPVC after completing the first building with steel was a smart move for Alwest – and the building owner,” Norwood said. He saved his client a significant amount of money compared with steel piping, primarily because CPVC pipe was much easier to install within the trusses. It’s cleaner installation techniques also kept building tenants happier by ensuring the offices were ready for business when the crews finished each day.

Based on his experience with the Sacramento office project, Norwood said he is enthusiastic about using BlazeMaster CPVC for future commercial projects. He is hopeful that the success of this project will encourage other sprinkler contractors and building owners to consider the use of CPVC in non-residential settings. “Using CPVC was not top of mind for me prior to this project, but now I’ll always consider it for future commercial retrofits as well as residential applications,” he said. “The ease of installation gives BlazeMaster CPVC a clear advantage over steel in many situations.”



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