APPLICATION BULLETIN

Copper/Brass/Bronze

COPPER FIRE SPRINKLER SYSTEM

Pelican Bay Apartments

Mesa, Arizona

COPPER DEVELOPMENT ASSOCIATION INC.

A Case History

THE SPRINKLER CONTRACTOR

Founded in 1982, Glendale Fire Protection has completed several hundred projects, including commercial, residential and special hazard installations. Glendale Fire Protection is one of the Taymar Companies, which employs 500 people and operates out of Glendale, Arizona.

Since 1982, they have installed more than 25,000 residential fire sprinkler heads, all but approximately 1,000 with copper tube. Glendale has a progressive approach towards their business, always staying abreast of the latest developments and trends in the industry. They have successully employed computer aided hydraulic design of their systems, achieving time and material savings and ensuring the quality of their work.

According to Glendale Fire Protection's general manager, Larry Loga, "Giving the customer the choice, they will almost always go for copper over plastic. In the case of CPVC, most customers feel they will get an inferior system, and are afraid of it deteriorating and leaking." Glendale also found the cost of copper tube and fittings to be approximately 38% less than CPVC. With regard to installation labor, on similar installations, CPVC was found by Glendale to average 1.18 hours per head, compared to copper at 1.16 hours per head.

THE INSTALLATION

The Pelican Bay Apartments are located on Main Street in the city of Mesa, a rapidly growing area near Phoenix, Arizona. The Architects, Artaform Architecture and Planning, have created a successful design, characterized by spacious and distinctive features. The complex lies on 19.6 acres of ground, east of the Tempe Canal, and comprises 472 luxury apartments, 60 of which were fitted with sprinklers.

The installation of fire sprinklers was done from an economic standpoint. Due to the layout of the complex, all the buildings around the perimeter could easily be reached by fire trucks and hydrants. The five buildings on the inside could not. The owners, Par Builders, took advantage of the design flexibility of higher density and cost advantages offered by fire sprinklers by contracting for sprinkler installation in five of the buildings where the trade-off benefits were found to be greatest.

A high quality but cost-effective system was offered by Glendale Fire Protection. Conforming to the NFPA-13 standard, the system consists of copper tube branches, Schedule 40 steel risers, and quick response, residential type, sprinkler heads. The sixty units that were fitted required a total of 806 sprinkler heads and approximately 6500 feet of copper tubing.

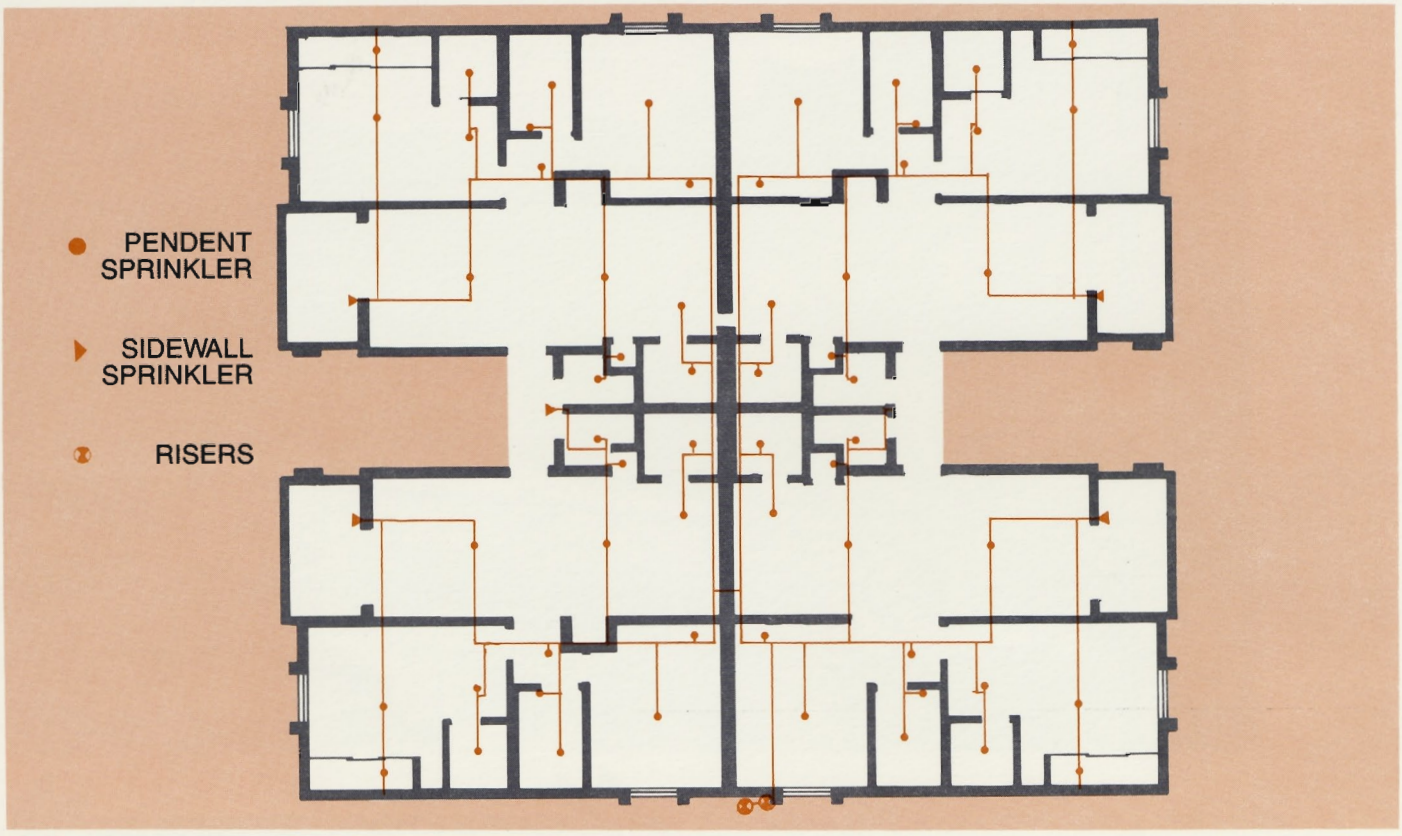

Figure 1: Sprinkler plan for typical floor in Pelican Bay Apartments.

TECHNICAL DISCUSSION

Glendale Fire Protection places much confidence in the use of copper in their systems, and have used it in most of their installations to date. According to their general manager, Larry Loga, "The choice of piping materials depends on the nature of the job. For many applications, copper can offer competitive installation cost. We found, for example, that on a 867-head hotel job, the material cost for copper was approximately 38% less than CPVC. Since the labor cost between copper and CPVC are almost the same, the total installed cost was less with copper than it would have been with steel or CPVC."

Glendale Fire Protection strives for a high standard in their work, and finds that the choice of copper helps them achieve it. They use 95-5 tin-antimony solder for joints, and test their systems to 200 psi, which helps to ensure that they will be leak-free over a 30 year life. To demonstrate the fire sprinkler system effectiveness, Mr. Loga cites one incident where a fire crept up within the walls, around the sprinkler piping of a building under construction. The Glendale sprinkler system, fortunately copper, had already been connected and functioned according to design, putting out the fire. Without it the building would undoubtedly have been lost. Had the piping material been plastic it might have melted or softened and failed, rendering the system inoperative without suppressing the fire.

To achieve better speed in construction, Glendale Fire Protection tries to use one inch copper tube as far as possible. Keeping to a universal size also allows a better supply of fittings. Korey Fowler, superintendent at the installation, indicated that the fitters like working with copper. He also pointed out that the strength and durability of copper tube was important since other subcontractors often subjected the piping system to rough handling. Another feature is that, for this project, they were able to penetrate 2-hour fire walls with copper, but not with CPVC or Polybutylene.

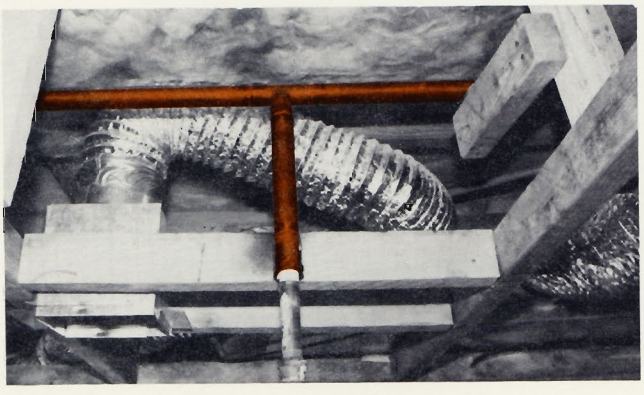

Figure 2: Typical tee-joint and copper drop for sprinkler head, with temporary threaded steel nipple and cap.

Flexibility is recognized as being one of copper's key benefits. According to Mr. Loga, "Residential wood construction is often a lot more cut up than commercial jobs, and there are a lot more variations from the plans. These factors make accurate prefabrication of systems very difficult. Copper systems are a lot easier to field fabricate. Also, in tight spaces, the tube can be worked on much easier. We have found that we had a reduction in leaks, and that saves a lot of troubleshooting time."

"We like working with copper, because it is light and flexible, unlike steel. For residential systems and apartment projects, copper is an excellent choice."

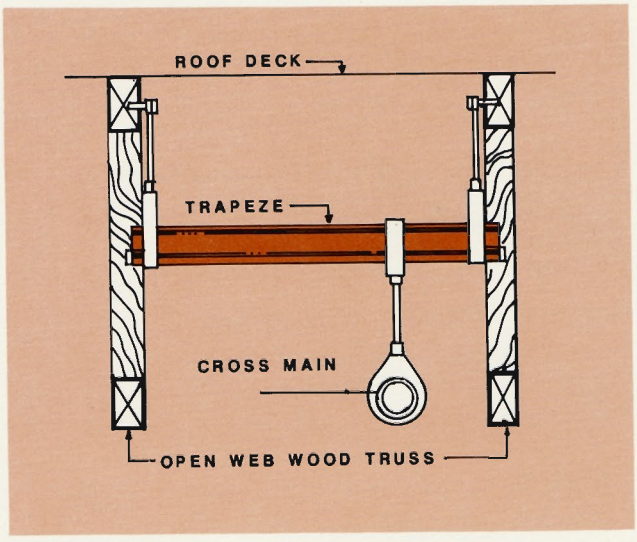

Figure 3: Open web wood truss hanger detail.

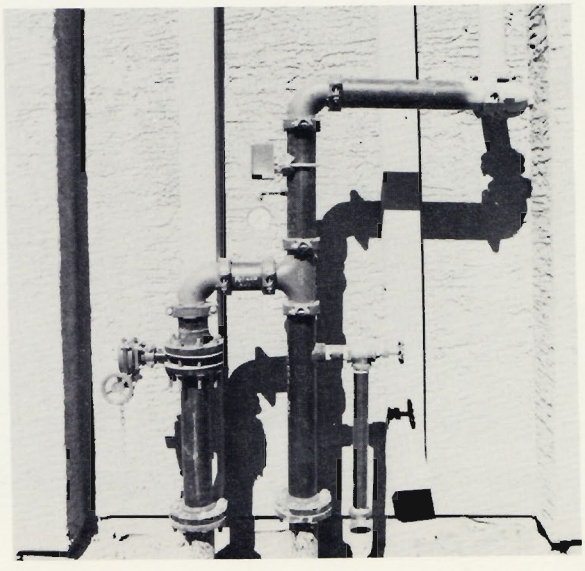

Figure 4: Check valve, flow switch and pressure gauge on riser.

SUMMARY DATA

Project	Pelican Bay Apartments, Mesa, Arizona
Description	Three story, 472-unit multifamily apartment complex. One- and two-bedroom units averaging 920 square feet in size. 60 Units fitted with sprinklers.
Sprinkler Contractor	Glendale Fire Protection 6826 N. 55th Avenue Glendale, Arizona 85311 (602) 937-2721
Sprinkler System	Type M copper branches from Schedule 40 black iron risers, conforming to NFPA-13. The system includes 806 quick-response residential sprinkler heads, and approximately 6500 feet of copper tube.
Basis For Copper Selection	Cost and quality incentives; strength; flexibility; easy site preparation; customer preference.
Owner	Par Builders Mesa, Arizona
Architect	Artaform Architecture & Planning Scottsdale, Arizona
General Contractor	Par Builders Mesa, Arizona

Statistical Information

no. of units =	60
total sprinkler heads =	806
heads per unit sprinkled =	13.4 (av.)

tube use by size (approximate) =

copper:		
1 in.	3,483 ft.	(52.5%)
1¼ in.	1,541 ft.	(23.2%)
1½ in.	894 ft.	(13.5%)
2 in.	582 ft.	(8.8%)
steel:		
4 in.	130 ft.	(2%)
Total	6680 ft.	(100%)

estimated copper fitting use =

ells	1170
tees	585
reducers	7
adapters C × F	806
Total	2568

Figure 5: Front view of the complex.

Figure 6: Quick-response ceiling pendent.