

**APPLICATION BULLETIN**

**Copper/Brass/Bronze**

**COPPER  
FIRE  
SPRINKLER  
SYSTEM**

**Wanamaker House  
Apartments**

**Philadelphia,  
Pennsylvania**



**COPPER DEVELOPMENT ASSOCIATION INC.**

# THE SPRINKLER CONTRACTOR

The "Automatic" Sprinkler Corporation of America was founded in 1910 and, since that time, it has grown into one of the largest fire protection firms in North America. Today, the company has 37 district offices, and about 1000 employees.

Automatic designs, installs, and inspects all types of commercial, residential and special hazard fire

protection systems. They also manufacture sprinkler heads, control valves, fire alarms and detection equipment.

The company is committed to providing its customers with the most cost-effective quality systems available. According to Joe Kiczek, District Manager of the Philadelphia branch office: "The best material choice depends on the nature of the job. Copper systems work particularly well where space is tight, or where you will encounter a lot of variation from the plans. Here, copper lets you make minor field adjustments quicker, and this helps reduce labor costs."

## THE INSTALLATION

The Wanamaker House is a new luxury high rise apartment building, just off Rittenhouse Square in downtown Philadelphia. Like many other cities throughout the country, Philadelphia encourages the use of fire sprinkler systems to improve life safety in such tall apartment buildings. These systems must conform with NFPA-13 requirements, but can use the new fast response residential sprinkler heads.

All 333 units in the Wanamaker House required sprinklering, but the choice of pipe materials was left to the individual bidders. Automatic submitted the most cost-effective proposal, which called for a hybrid system, with copper loops and branches on each residential floor, fed by schedule 40 steel risers. All parking garage lines were steel.

The installed sprinkler system uses the best available technology to insure maximum fire safety for the building and its occupants. The quick response sprinkler heads react to a fire in only one fifth the time of conventional sprinkler heads, extinguishing the blaze at its source, before it can spread to cause major damage.

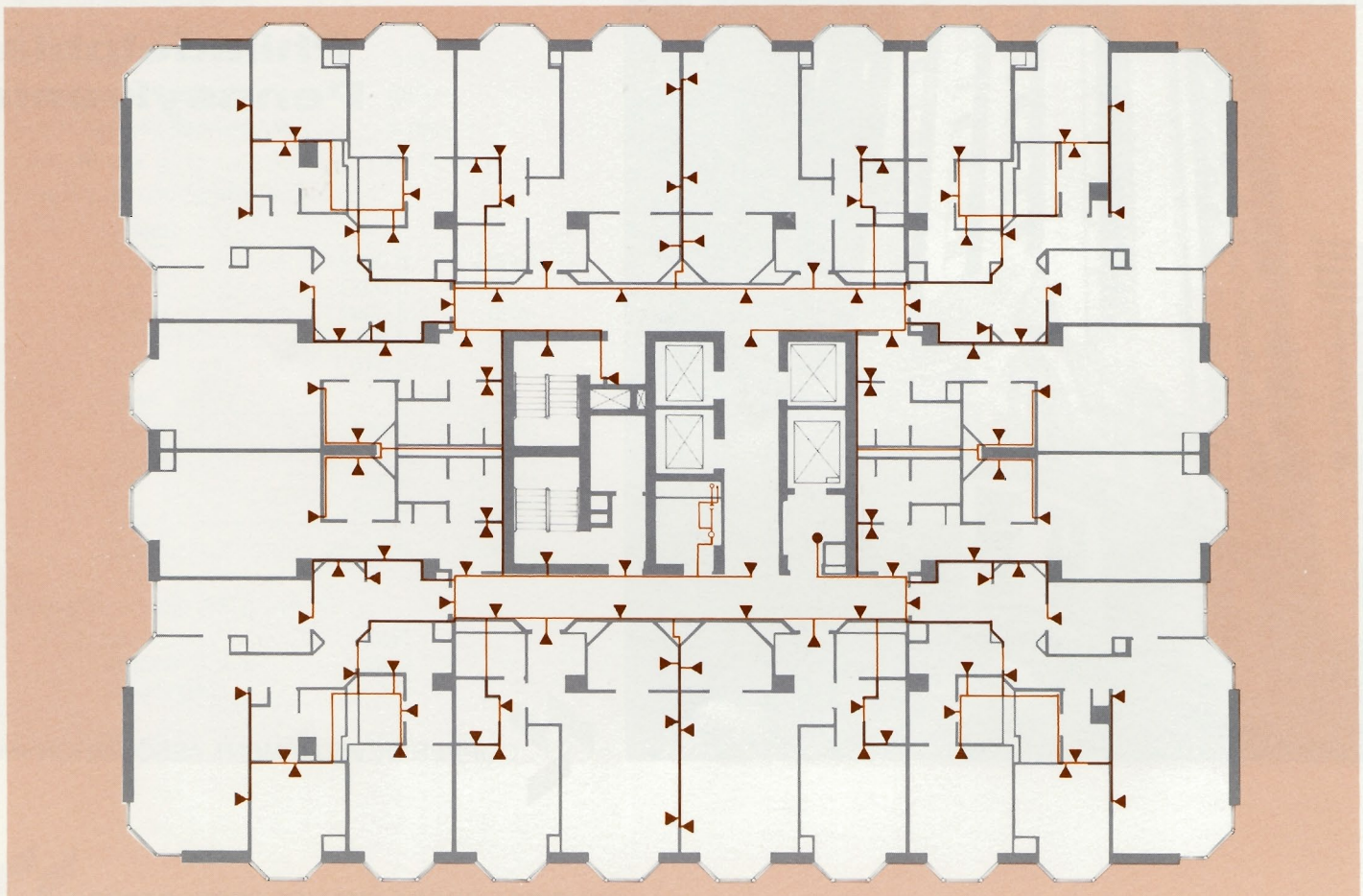


Figure 1: Sprinkler plan for typical floor in Wanamaker House.

# TECHNICAL DISCUSSION

When Automatic was asked to bid on the fire sprinkler system for the Wanamaker House, they faced a number of difficult technical problems. "The Architects designed the structure to utilize the finished concrete slab for the apartment ceilings—suspended ceilings were not used." The sprinkler pipe had to run through the interior partitions, which only provided a 2½ inch wall cavity. Copper tubing was smaller than an equivalent steel pipe, and could fit into the space more easily.

According to Joe Kiczek, "We also knew that with this type of construction we could expect a lot of variation from the plans. This meant a good deal of field adjustment would be needed, and this would go much quicker with copper . . . You can just cut, ream and braze it, right on the spot."

In the actual installation, round holes were stamped into the studs, six inches down from the ceiling. Copper tube was then run through these holes to the sprinkler head location. Approximately 95% of the sprinkler heads were then wall mounted.

This project was a significant departure from Automatic's traditional practice of using steel, but according to Kiczek "We didn't run into any serious problems, and it only took a couple of days to train our fitters to work with copper and the T-Drill tool." Together, copper and T-Drill reduced the total job cost by about 15%.

Kiczek explained that in buildings like this, you can achieve the best economy by using copper for sizes up to two inches, and using steel for the large mains and risers. Bi-metallic unions were not considered necessary, since the sprinkler system water is completely static.

"There were a few early problems, such as using the proper terminology, so the correct fittings could be ordered. We also had some initial inventory problems, but these were solved by setting up a temporary stock room in the building, so all of the necessary pieces were available at the site."

"We didn't have much difficulty with brazing, and had few leaks at the T-Drill connections." Clearly, copper works well for jobs like this, where space is tight and the system can not easily be pre-fabricated.

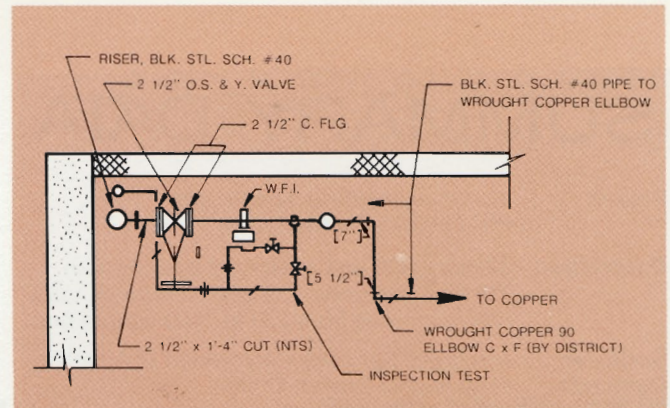


Figure 2: Steel riser/ copper loop connection detail.



Figure 3: On site brazing.

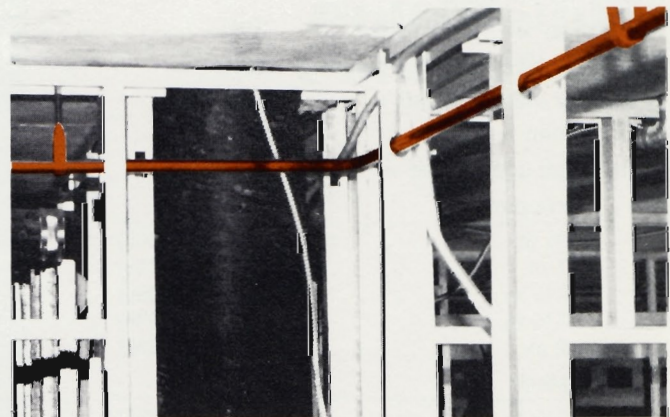


Figure 4: Typical tube run through walls.

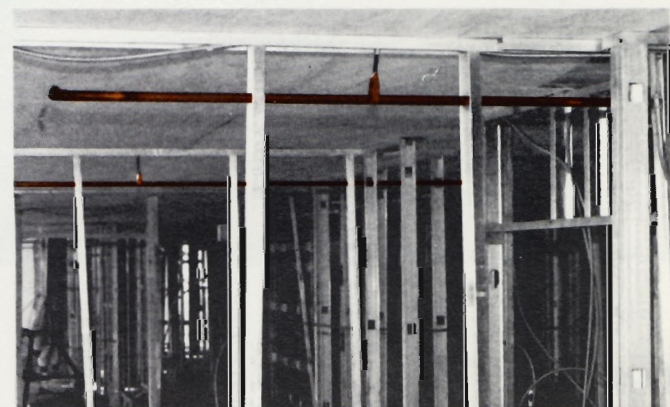


Figure 5: Branch line before sprinkler installation.

# SUMMARY DATA

**Project** Wanamaker House Apartments  
Philadelphia, Pennsylvania

**Description** 33 story, 333 unit apartment building with 318 high rise units. 1, 2 and 3 bedroom units ranging in size from 550 to 1900 square feet.

**Sprinkler Contractor** Automatic Sprinkler Corporation of America, Philadelphia Branch Office  
201 King Manor Drive  
Suite F  
King of Prussia, Penn. 19406  
(215) 277-1190

**Sprinkler System** NFPA-13 type system with copper branch lines and Schedule 40 steel risers. The system includes 2850 quick response residential sprinkler heads, and 21725 feet of copper tube.

**Basis for Copper Selection** Space limitations on sprinkler pipe, easier site fabrication, and lower project cost.

**Owner** W.H. Venture  
Philadelphia, Pennsylvania

**Architect** Barancik Conte & Assoc.  
Chicago, Illinois

**General Contractor** L. F. Driscoll  
Bala Cynwyd, Pennsylvania

## Statistical Information

(High Rise Sections)

no. of units =	318
total sprinkler heads =	2850
heads per unit sprinkled =	9 (av.)
tube per unit =	68 ft. (av.)
tube & pipe use by size =	
copper:	
3/4 in. ....	16100 ft. (73%)
1 in. ....	1800 ft. (8%)
1 1/4 in. ....	1800 ft. (8%)
1 1/2 in. ....	1350 ft. (6%)
2 in. ....	675 ft. (3%)
steel:	
1 1/4 in. ....	138 ft. (0.6%)
1 1/2 in. ....	52 ft. (0.2%)
2 in. ....	26 ft. (0.1%)
4 in. ....	240 ft. (1.1%)
Total .....	22181 ft. (100%)

estimated copper fitting use =

ells .....	2417
adapter C x F .....	2900
couplings .....	375

Total .....5692

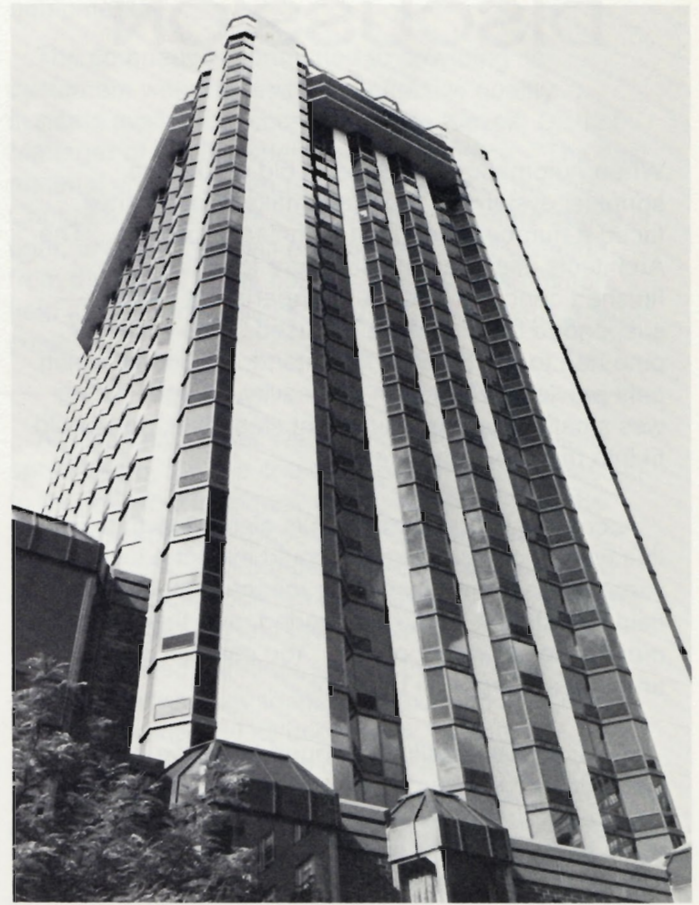


Figure 6: Wanamaker House.

**NOTICE:** This Application Bulletin has been prepared for the use of fire protection contractors and others involved in the design and installation of fire sprinkler systems. It has been compiled from information supplied by the referenced fire sprinkler contractor and by consulting organizations that Copper Development Association Inc. believes to be competent sources for such data. However, CDA assumes no responsibility or liability of any kind in connection with the Bulletin or its use by any person or organization and makes no representations or warranties of any kind thereby.

