



Technical Features – Fire Construction Fire Wall Stands Up To Ultimate Test

ONE SMALL SPARK FROM AN UNATTENDED FIREPLACE AND SUDDENLY AN ENTIRE TOWNHOUSE IS CONSUMED BY FIRE. BUT NINETY-FIVE OTHER UNITS IN THE SEVEN-BUILDING MILLRACE GARAGE TOWNHOMES COMPLEX WERE SAVED, THANKS TO THE SUPERIOR PERFORMANCE OF FIREWALLS SEPARATING THE TOWNHOUSES.

(Editor's Note: This article originally appeared in the 1995, Issue 2 of Form Function. Some pictures, graphics or charts may not appear in this version. To receive printed copies of this article, or information about the products mentioned in it, can be obtained by writing: Editor, FORM FUNCTION, 125 South Franklin Street, Chicago, IL 60606-4678.)

The fire demonstrated the effectiveness of space-saving USG Area Separation Wall Systems. Two types of USG Area Separation Walls, cavity-type in sided walls and solid-type in back walls, were used in each unit. "This was only the third project in which we had used the gypsum fire wall system," said Jay O'Brien, project architect for Roy, O'Brien and Creaser, fo Gaithersburg, Md., designer of the project (which was constructed in 1981). "Formerly, we specified masonry construction for fire walls, but now, most of our clients prefer the gypsum system. You rely on design and test data of the system, but you don't actually know if it works until an accident occurs," he continued.

Although the unit where the fire originated was completely destroyed, further tragedy was averted. Damage to the adjacent units was limited to a charred deck on one unit and some minor damage to the adjoining rooftops. While the unit destroyed will have to be rebuilt, further repair costs will be minimal. The key to the success of the USG Area Separation Wall performance is a special aluminum clip that allows the damaged structure on the fire-exposed side of the occupancy-separation walls to fall away without pulling down the firewall.

"The way this particular complex is built made it a difficult fire to fight" explained Chief James Magruder of the local Gaithersburg-Washington Grove Fire Department. "There are four units opening on a common courtyard. The fire was in a rear unit which faces a lake and has only a narrow grassy area behind it, limiting our working space."

"Station Eight is only a few minutes from the site, but the fire was really burning when we arrived. Actual fire fighting lasted two hours. The fire destroyed the unit quickly, but the fire walls kept everything contained in that unit," he added. Surrounding townhomes suffered smoke and water damage, but only incidental fire damage.

Two different area separation systems, both providing fire-resistant walls from ground level to roof, were employed in the construction of the Millrace Townhomes. On the sides of the units, cavity-type USG Area Separation Walls

were used. Between back-to-back units, solid-type USG Area Separation Walls were used.

Cavity-type area separation walls are used as commonly shared party walls and fire barriers with non-load-bearing framing. They consist of USG Steel C-H Studs and 1-in. SHEETROCK® Brand Gypsum Liner Panels set in USG Steel C-Runners and faced both sides with 1/2-in. SHEETROCK® brand Gypsum Panels, FIRECODE C Core.

The solid system is built with two 1-in. SHEETROCK® brand Gypsum Liner Panels installed vertically between 2-in. steel H-studs and C-runners. For sound attenuation and added fire protection, THERMAFIBER SAFB insulation can be added to both area separation wall systems.

Both systems function the same way. The fire resistant Gypsum panels provide 2-hr fire-rated performance (3-hr. rated USG Area Separation Walls systems are also available). The steel studs holding the gypsum panels are attached to the unit's wood framing using aluminum angle clips. When exposed to fire, these clips melt and break on the exposed side, allowing the burning wood frame to fall away. The fire barrier remains intact to protect adjacent units. Through numerous building fires, properly installed USG Area Separation Walls have never failed to function as designed, and have protected adjacent areas as required.

"Our primary concern in this project was the complexity of the property lines which met in a common courtyard serving four separate units," O'Brien pointed out. "The USG Area Separation Wall System allowed us to save space and put more square footage in each unit without compromising fire safety."

In addition to its function as a space saver, the USG Area Separation Wall System's ease of assembly helped cut costs. "The material costs for the gypsum wall system vs conventional masonry were almost break-even in the early 1980's, but installation time and cost were significantly reduced with the gypsum system. The fire wall panels could be slid into place by the builder as each floor was constructed, rather than waiting to begin framing until masonry work was completed."

The Millrace fire demonstrated the USG Area Separation Wall fire resistance is first-rate. "I am very impressed by this area separation system as a fire wall. It performed exactly as designed," O'Brien concluded.

*See FORM & FUNCTION, Issue 1, 1980, for an article about another fire in a townhouse project using the same system.

Millrace Garage Townhomes, Montgomery Village, MD.
Architect: Roy, O'Brien, & Creaser
General Contractor: Kettler Brothers, Inc.