New Charlotte Convention
“Bookend” Fire Protection Chal

By James
Experience makes a big difference in both dealing with complexity and applying acquired knowledge to brand-new challenges. For Warco Construction, Inc. of Charlotte, N.C., many years of specialized fire protection experience paid off with rewarding solutions to “opportunities” that bracketed the construction cycle for the new Charlotte Convention Center, completed early this year. On the front end of the project, long-span 90-foot trusses over the facility’s exhibit space posed complex challenges both for estimating and applying sprayed fire protection. And in the final weeks of construction, an “eleventh hour” firestopping requirement due to post-specification code changes demanded an immediate answer and round-the-clock application to preserve the project schedule.

In addition to hard-earned skill and expertise, Warco credits the ability to turn to a single, reliable source for its timely success in satisfying both fire protection needs. Because of its long-term experience with sprayed fire protection manufacturer Isolatek International (Stanhope, N.J.), Warco knew that the company could also provide a product that would satisfy the urgent firestopping requirement—and the training to support efficient first-time application.

**Long Spans and High-Profile**

Owned by the city of Charlotte, the new exhibition showcase has won kudos for being versatile, accessible and attractive. Based on total exhibit space, the $89 million, 850,000-square-foot Charlotte Convention Center ranks among the top 20 convention centers in the country. Yet it is designed “to human scale,” explains Project Manager Harry Sherrill of The FWA Group (Charlotte), co-architect for the project. To avoid overwhelming the approaching pedestrian, much of the exhibit space is recessed below ground level. All 22 loading dock bays
Sprayed fire protection for the structural steel and fireproofing for top-of-wall construction gaps were handled by an extended building team, which included (from left): Project Architect Don Cash and Project Manager Harry Sherrill, both of The FWA Group; Bob Krapish, technical sales representative for Isolatek; Warco Construction CEO Bud Warren and Project Manager Dave Stukey; and Eric Wagner, civil contracts manager for Fluor Daniel. Photo by Pat Shanklin Photography (Charlotte).

For Warco, the case for the efficiencies of this solution was equally strong. With approximately 150 trusses, the fire protection for this steel represented almost half of this unique job. Each 9-foot-deep truss consists of a pair of beams joined by 10 to 12 sets of diagonal members across the 90-foot span. The members vary in size within and between segments, depending on the stress at each point in the span. And each variation in the steel required another adjustment in the fire protection thickness needed to achieve the two-hour fire rating for the truss.

The facility boasts 280,000 square feet (6.5 acres) of contiguous exhibit space on the ground level—supported by long-span 90-foot trusses. Almost 93,000 square feet of meeting space, including a 35,000-square-foot ballroom and up to 46 meeting rooms, are located above the exhibit level. The meeting and exhibit space wraps around one main concourse for convenience and easy access. The striking design also incorporates extensive glass to open the interior to city vistas for easier orientation. The interior space features a cylindrical skylight at the intersection of two barrel vault shapes.

Bookings and attendance statistics attest to the drawing power of these facilities and features. A little more than halfway through its first year of operation, total event bookings for 1995 were almost double—and attendance almost triple—the prior-year numbers at the city’s much smaller, predecessor convention center. The convention center has commitments booked through the end of the decade.

With only a few weeks to go before the official opening date, Warco’s crew of 12 worked around the clock. In addition to speed, precision was important to minimize product waste, and because carpeting and some ceiling tile were already in place.
Warco Construction Assistant Project Manager Bill Morrissey loads a hopper with dry-mix fire protection. Water is added at the nozzle during spray application. Approximately 22,000 bags were used for the new convention center. Photo by Pat Shanklin Photography (Charlotte).

required the use of a computer model for estimating. According to Warco Vice President Hans Warren, two estimators working separately as a cross-check each spent a full week completing the cumbersome task of identifying and entering all the variables.

The application process for the entire structure, which began in August 1993, lasted almost 15 months. Warco Project Manager Dave Stukey credits this dry-spray solution for a major contribution in streamlining a very complex operation. “The ability to spray BLAZE-SHIELD II to each required thickness in one pass gave us the flexibility we needed for maximum efficiency in our scheduling,” Stukey explained.

The convenience of dry-spray application also facilitated the job of spraying 30-foot high trusses from four different angles using scaffolding. “When you’re working at that height and holding a spray gun within 2 feet of the surface to control the application, pumping dry material and adding water at the nozzle is a lot easier than pumping a heavy slurry mix from the ground,” he said. “And being able to clean up with a broom saves a lot of time.”

In addition to the exhibit hall trusses, fire protection was applied to all elevated floor slabs, a small portion of roof decking over the top level mechanical rooms, and joist up to 20 feet. Ratings of two hours were required for floor construction and for beams, girders and trusses supporting one floor, and three hours for steel members supporting more than one floor.

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Efficient, on-time performance in meeting the demands of the sprayed fire protection earned a request for Warco’s assistance with an urgent firestopping need identified in the final weeks of construction. And Warco’s experience as a CAFCO fire-protection contractor ensured confidence in recommending a reliable solution from Isolatek’s TPS® Intumescent Caulk.
mal solution because of elastomeric and adhesive properties that make it suitable for assemblies subject to vibration, deflection or possible seismic movement. It was also a plus that the recommended firestopping material satisfies the requirements of the new UL safety standard for flexible joints, which becomes effective next year.

Field support was important to Warco in its first experience with applying this particular firestop product. “The schedule was incredibly tight,” says Dave Stukey, “but we knew we could count on getting whatever training and technical help we needed to apply the material efficiently—and to ensure proper firestop performance. Isolatek’s field service tech was down here for a full week when we got under way.”

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Applicators used putty knives to apply the caulk from pails over mineral wool batt for gaps greater than half an inch, and quart tubes with caulking guns for smaller gaps. “There’s no thinning or pre-mixing required,” Stukey said, “and the material is water-based, so any cleanup was easy. Plus, the product stands up well. Even for the 3-inch flutes, we could apply what we needed in just one pass.”

With trusses sprayed and all offending gaps successfully sealed on schedule, Sherrill applauded all parties: “When the job is difficult and the schedule tight, especially for a life-safety application like fire protection, it’s very reassuring to deal with a specialist contractor and a reliable, single-source manufacturer.”

About the Author
Jim Verhalen Jr. manages Isolatek International’s TPS® Through Penetration System® line of firestopping products. He has 20 years of prior experience as an industrial and commercial insulation contractor.