Whether or not this particular project is the biggest project of its kind is open to debate. But it certainly is one of the largest and, therefore, interesting enough to merit attention. Ordinarily, the Chicago building codes would not require fireproofing on a structure of this size and scale, but McCormick Place has a unique history.

This huge convention center, built in the 1970s, has had two major fires. One of them, shortly after it was built, reduced the entire structure to rubble. The rebuilt center, McCormick Place East, plus McCormick Place North, now amount to almost 60 acres, with about 1 million square feet of exhibition and conference hall space.

McCormick Place South, the new facility that Grace has been involved in, doubles the previous area to about 120 acres and 2 million square feet.

There were many challenges. “Most of the work was done off scaffolds 60 feet in the air,” says Mark Stemmons, project manager of the Hammond, Ind.-based J. L. Manta, Inc., which served as subcontractor for the fireproofing work, along with Chicago’s Cole & Associates. Stemmons explains that there were 40,000 tons of structural steel. Because the intent was to maximize the amount of open space, however, there are only about 40 columns, but they are megacolumns, about 12 feet by 12 feet.

It would seem that steel structures so thick and high would never be affected by fire. But that’s exactly what happened the first time when an explosion caused a fire that devastated the meeting and exhibition hall. Although the columns were fully protected, the roof girders were not; they eventually failed, causing total collapse of the roof less than 30 minutes after the onset of the fire. The exhibition hall was a total loss.

“Once steel heats up to 700 to 800 degrees, it weakens and begins to deflect,” Gerace says. “If that occurs, you face the ultimate catastrophe of having the structure collapse. In the event of a fire, the time that fireproofing affords provides a
significant measure of safety for the egress of occupants and firefighters.” Spray-applied fireproofing delays the transfer of heat to the structural steel for up to four hours, depending on the thickness to which it was applied.

To the Rescue
The fireproofing crews came in early on the job, right after the excavation, setting up of the steel and pouring of the concrete. Manta’s $8 million contract started in April 1994 and is expected to be completed by October of this year. “We had to be pretty aggressive to get the job done,” says Stemmons. The convention center stayed in operation while the crews worked, which meant a lot of coordination, such as bringing in truckloads of materials while loading and unloading was taking place for the regular convention activities. Since the new structure was a tie-in to an existing building which had already formed its own traffic patterns, care had to be taken not to get spray onto nearby Lakeshore Drive, or Interstate 55. Since a portion of the job was over a commuter rail line, crews had to work from 4 p.m. to midnight so as to not cause the train to be shut down.

One challenge, Stemmons says, was the use of three different grades of fireproofing-standard, medium and high density—on the same project. All three are Grace products. The Monokote® MK-6 fireproofing material, utilized on interior structural steel, is the most widely used fireproofing product in the world. Gerace explains that Grace Monokote products are cementitious, which means that the products are mixed with water to form a slurry, conveyed through a hose and then spray applied to the substrate. Cementitious products develop a plaster-like coating and provide superior physical properties such as bond strength, compressive strength and resistance to air erosion.

At McCormick Place, the Monokote Type MK-6 material was used in the interior spaces, where it would not be exposed. The medium-density Monokote Type Z-106 is designed for exposed interior areas where it must withstand traffic and high humidity and have high damage resistance. This product was used on many of the exposed columns. The high-density Monokote Z-146 concrete-like fireproofing is typically spray applied to both exterior and interior areas subject to high impact and true exterior exposure and can withstand freeze-thaw, wind, rain and other climatic conditions. This was used in selected areas such as column trusses which are most exposed to erosion, such as those areas from which banners are hung.

Improving on Perfection
Gerace reports that Grace Construction Products has had an ongo-
ing commitment to research and product development and that the expenditures devoted to R&D have continually increased. One significant development has been the patented Monokote Injection System, which utilizes an accelerator to decrease set-time and increase yield.

“This is unique to the industry,” Gerace says. “Injection allows the applicator to apply the fireproofing material more efficiently. You get improved yield and an almost instantaneous set of the Monokote, which provides a significant competitive advantage to Monokote applicators. Also, we have recently introduced our Monokote HY (High Yield), which delivers even higher yield.” Gerace also points out that Monokote Type Z-146 was developed in 1991 and has enjoyed wide acceptance as the “preferred” high-density fireproofing product.

New technologies on the horizon are quickly changing the way we specify and estimate fireproofing applications. Gerace notes “We have made a substantial, ongoing investment toward improving the delivery of information to our customers.” One example of this is sales force automation, an ongoing initiative that allows a Grace sales representative the ability to access project information, product specifications, UL letters and estimating programs direct from a laptop computer.

“Grace sales representatives can now work right in the applicator’s office, providing many different types of product information and technical support almost instantly,” Gerace says. “We keep looking to see where the fireproofing industry will be in five to 10 years. We are the market leaders, and we intend to keep on developing new products and services that will meet our customers’ needs.”

Deep Industry Roots

One reason Grace looks so far into the future is that its history is rooted so far in the past. Grace Construction Products had its start in 1919 as the Dewey and Almy Chemical Company. Over the years it acquired a worldwide reputation for technological leadership, especially in the area of specialty chemicals for cement and concrete. In 1954, it was purchased by W. R. Grace & Co., and began its modern era of growth and diversification.

Grace Construction Products today is a leading manufacturer worldwide of concrete admixtures, cement additives, masonry and waterproofing products, in addition to its fireproofing product line. This division has 1,900 employees worldwide with 1994 revenues of $387 million.

The J. L. Manta, Inc., a company with 400 to 500 employees and about $50 million in annual sales, also has a long history, going back about 80 years. It originally specialized in painting, especially in the petrochemical, refining and public works industries, moving into lead abatement, hydroblasting and then fireproofing. Its main fireproofing work has been industrial, but its background made it very suitable for McCormick Place, a commercial project on an industrial scale.

Any Regrets?

Asked whether his company encountered any real problems with taking on a project of this scale, or whether there were any regrets, Stemmons replies, “It was a good experience. Once you accomplish a job like this, it gives you a lot of confidence in taking on your next challenge.”

Stemmons credits a lot of the success of the project to the support offered by Grace. In fact, Manta presented Grace with its 1994 “Supplier of the Year” award. Says Stemmons, “The material deliveries were always on time. And the Grace representatives were very helpful on code interpretations and other technical matters, such as helping to maximize yields. If a pump or anything else didn’t seem quite right, they were there to make it right.”

This kind of service isn’t something Grace started just for Manta. “Unlike other manufacturers of fireproofing material, we have a dedicated consultative sales staff to help both contractors and architects manage complex projects such as this,” says Gerace. “Fireproofing is not a simple process. There are many ways a job can be fireproofed, and to do it right, you have to think through a number of different variables. We don’t just work for a bid and then walk away with an order. Our guys get in there early to help provide solutions. We had a team that worked on the McCormick Place project providing support to the architect, the sub-contractor, testing agencies and the general contractor. We were with this project every step of the way.”

Membership Matters

In terms of Grace’s involvement with the Association of the Wall and Ceiling Industries—International, Gerace says, “We are very happy with the association. AWCI has been very helpful by providing a number of different forums for education and communication about various industry issues, all of which help our applicators learn about new products and new techniques that help maintain industry standards.” Gerace also expressed pleasure at the 1995 joint exposition of AWCI with Ceilings & Interior Systems Construction Association, which was held this past April in Nashville, Tenn. “This shared venture expanded the menu by offering more exhibits, more learning experiences, more opportunities,” he said.

Stemmons also liked the idea. “We enjoyed the convention because it allowed us to see what other contractors were doing nationwide,” he says. “And, with CISCA there we got a chance to meet a lot of the suppliers. It happened we were in the market for some new equipment, so the joint convention provided us with some one-stop shopping.”

About the Author

Michael J. Major of Port Townsend, Wash., is a free-lance writer for the construction industry.