Fireproofing Goes SKY-HIGH

The Tallest Building West of the Mississippi Created Spectacular Logistics and Planning Problems When it Came to the Fireproofing

When Seattle’s Columbia Center Building opens its doors for occupancy in January, 1985, tenants will find themselves in 2 million square feet of the tallest office structure west of the Mississippi and north of Houston.

The building site is most of a cramped block in the city’s downtown financial district, on a sharply-sloping hill near the continual traffic of Interstate 5. The Columbia Center seems to wrap around the only other building on the block in a concave-convex triangle design arranged to make maximum use of the property, a real indicator of the growth of office space projects in the Pacific Northwest.

Fireproofing the 15,300 tons of structural steel in the Center’s 76-story frame was an accomplishment of special interest, if only because of the physical problems inherent in working on the congested site—with its constant heavy traffic—and working to a topped-out height of 943 feet (which makes the building visible to suburban communities as much as 20 miles away).

These conditions created special material, people and management problems for the fireproofing contractors, Pacific Construction Systems of Bellevue, Washington, Seattle developer-owner Martin Selig and

The job called for fireproofing some 15,300 tons of structural steel in the Center’s 76-story frame — from a congested site with constant heavy traffic. The major challenge posed by the Seattle Columbia Center Building was simply getting the fireproofing material pumped up to a topped out height of 943 feet—particularly when there was room for only one pumping site.
Howard S. Wright Construction Company, general contractor, were confident that a large and experienced applicator such as Max Jensen’s Pacific organization would fill the bill by emphasizing planning and preparation from Day One.

With other trades on the tight site, there was room for only one permanent pumping station at street level, with virtually no room for storage of the more than 100,000 bags of fireproofing material needed to cover the 1.2 million board feet of steel structure. Faced with these material and storage limitations, the Pacific team knew that deliveries needed to be rigidly scheduled and run like clockwork, for the full term of the project.

Scheduling, of course, is the most important of all planning activities. Often, it’s the great equalizer between jobs large and small. On this job as on others, the spraying had to be done when each floor was in to insure proper application, undisturbed cure time and exposed pipes and ducting for later access. A common enough process, but multiplied in the Columbia Center by 76 floors!

A more fundamental problem faced

Experienced personnel combined with good and well maintained equipment at both ends of the pumping chain spelled success in the Seattle job.

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by Pacific was the physical demands of pumping all the way to the top from a single street-level station. Would it take special equipment, special procedures, special magic? How would the people and equipment hold up, and still maintain the ambitious schedule to be met in every area of the Center’s construction?

Well, the answers to these pressing questions were straight-forward enough: it would take good equipment, well maintained, experienced personnel at both ends of the pumping chain and sound planning to make it all happen as Pacific had committed to. Technical support from the local factory representative for the materials manufacturer was instrumental in making the job go smoothly, and in making some basic equipment and process decisions.

A high-production Essick TM-30 plaster pump was used, providing sufficient capacity throughout the term of the project. Mixer and other equipment were conventional, also.

But special attention was given the special start-up, mix and clean-up procedures developed for the Center job. By the time the application area neared the full height of the building, about 45 minutes mix time was required just to prime the line at the start of work in the morning. With up to 12 batches of fireproofing mixed in the line before any came out at the top, the Pacific team had to cease mixing as much as 1¼ hours prior to the end of the day’s spraying, so as to prevent having the system plugged with set material.

Part of the set-up consideration was to maintain the lowest possible level of line friction. This was accomplished by using the absolute minimum number of pipeline restrictions, couplings, bends and other friction-inducing occurrences. Hose used was 2000-pound capacity, to absorb the sizable pump shock. The 1¼-inch whip hose proved right for the job, being easier to handle over long work periods.

Familiar practices connected with overspray protection (with tarps) and surface preparation had to be closely coordinated as part of the set-up, too. Again, scheduling was vital in making sure the crew had sufficient production time to do the day’s job and could, in fact, keep up with the production levels expected.

As the technical manuals on the subject advise, whenever the nozzle is out of sight of the pump, some form of communication is essential to coordinate pump and sprayer. For the Columbia Center, Pacific depended on reliable 2-way radios and crews experienced in working together. Pre-job conferences and other means of coordination helped assure proper application without waste, even with the pump and nozzle almost 1000 feet apart (by the end of the job). Fireproofing this project proved the possibilities of increased productivity with quality people working together.
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Of course, equipment maintenance was vital to Pacific’s success on the job. Daily routine maintenance and cleaning, coupled with scheduled machine overhauls, assured that all gear was clean, working properly and prepared to deliver maximum capacity and consistent product delivered to the application point. Any deviation from total reliability was not acceptable, a standard strictly adhered to throughout the course of the job.

On the matter of material delivery to the floor used, Pacific’s Drywall Division also deserves high marks. The same site congestion which limited fireproofing to a single pumping/mixing area also limited wallboard stocking as the building rose. Wallboard was, of necessity, limited to one lift at a time, resulting in the real need for extremely precise coordination of supply trucks and crane.

The need for close coordination was underscored by the massive amounts of materials used by Pacific drywall crews on the project. Combining basic core work plus estimated tenant-specified improvements, crews will have installed (on completion) approximately 30 miles of partitions. That includes 60 acres of sheetrock—about 77,000 sheets—using 240 miles of framing metal, 110 miles of drywall tape.

The Columbia Center, designed by Chester L. Lindsay Architects of Seattle, has a whole list of superlatives: most expensive building permit in the city’s history, largest excavation for a foundation, and of course, landmark size. But it’s also a good possibility that the management and crews of Pacific Construction Systems have demonstrated by on-time, economical performance on this extraordinary project a landmark we in the industry can share—fully-proven materials and processes used matter-of-factly to achieve some highly unusual results. That’s good news for business, good news for all of us.