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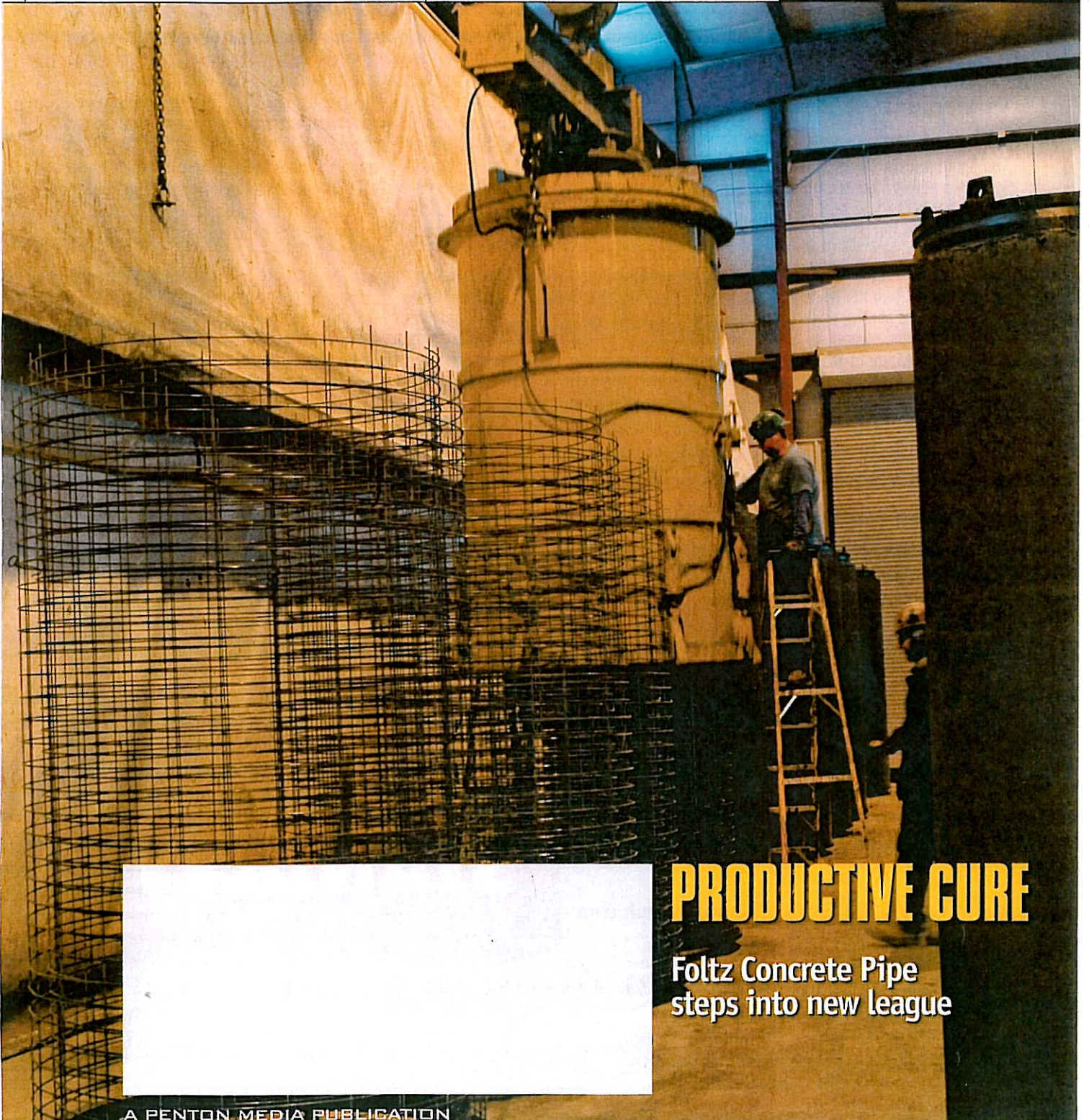
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APRIL 2009

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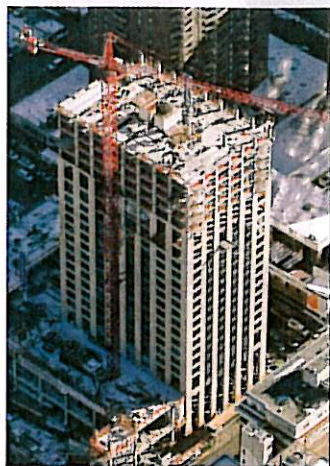


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ROCKY MOUNTAIN PRESTRESS CLADS WEST'S TALLEST C-I-P TOWER



This aerial view of the \$350 million Four Seasons Denver was captured at about the building's halfway point. The structure is the tallest concrete building west of the Mississippi River.

The 10-hour Four Seasons Hotel & Private Residences Denver foundation pour was completed using 170 truckloads of material at a pace of 20 trucks/hour, or one truck every three minutes, using three pumps running continuously.

Downtown Denver's \$350 million, 45-story Four Seasons Hotel & Private Residences project has been under construction since September 2007. With a hotel component of about 230 rooms and 102 condominiums—including two penthouse units, one that sold for \$8 million, the other for \$10 million—the building has been going up at a rate of one floor per week, with the scheduled final-floor top off set for May and project completion in early 2010.

In many ways, the Four Seasons Denver, with the highest average hotel room rates in the city and asking prices for one- to four-bedroom condos ranging from nearly \$900,000 to \$7.5 million, might seem out of step with the tough economic times. But for local precaster Rocky Mountain Prestress (RMP), the structure marks an important benchmark. Not only is the building the tallest RMP has ever worked on, but when completed, the structure will be the tallest concrete building west of the Mississippi at 565 ft. (641 ft., including a spire), besting Los Angeles' luxury condo tower The Century by 85 ft.

Using designs from architectural firm Carney Architects of Jackson Hole, Wyo., general contractor Swinerton Builders tapped RMP to cast 783 pieces, 658 of which were erected, while the remaining 125 pieces were cold-jointed at the plant prior to installation, all of which was done

by RMP. Approximately 2,400 yd. of concrete was used for the precast pieces.

The reusability of forms was crucial to RMP maintaining the pace of a one-floor-per-week schedule. All cold-jointed pieces were produced out of three molds, while infill elements between vertical columns came out of two molds. Five other molds produced at least 40 precast pieces each.

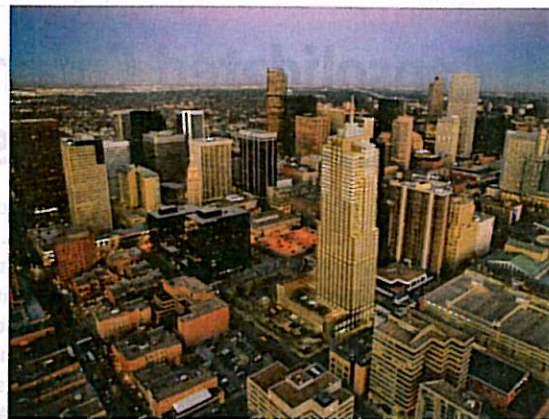
To avoid daytime city traffic and take advantage of Denver's limited number of residents living in the downtown area, all precast deliveries and installation were done between 9 p.m. and 5 a.m. from the RMP Architectural plant, located about six miles from the job site on 30 acres with all product being cast inside a 50,000-sq.-ft. facility. Even with few people living downtown, a strict noise ordinance was in place during overnight hours.

After the panels were cast and reached their strength, RMP used an acid-etch finishing treatment. The panels' tan/beige coloring was decided upon after nearly a year of debate. A piece of honed granite with a pinkish hue was given to RMP by the building owners for color matching. Using Solomon Colors pigments, the color was matched, but the owners decided against it in favor of the current coloring, which matches other buildings in Denver.

Two drivers were typically cycled each night to get the panels to the crane. When the floor layout allowed it, RMP was able to erect about 50 panels per week. The lower two levels had panels with integral 2.5-ft. returns on both sides of the column cover. Floor-to-floor heights were 22 and 24 ft. These returns had to be tucked under the



PHOTOS: Rocky Mountain Precast/Swinerton Builders



A rendering of the finished Four Seasons, taking its place in the Denver skyline.

RENDERING: Carney Architects

The image on the left shows test slabs of the original pinkish color the Four Season's owners were attempting to match with the help of Solomon Colors. However, after about a year of debate, they went with a beige color that matched several other structures in downtown Denver.

cast-in-place floor structure. Because the typical column cover panels were 7 ft. wide x 30 ft. tall x 7 in. thick, they were shipped on the 30-ft. side of the panel, which then needed to be hoisted to the vertical position from the truck bed. RMP had to fabricate a "tripping device," since the tower crane had only a single load line, and there wasn't enough room for a secondary crane to aid in the tripping of the panel to the vertical position.

The foundation pour for the building's 145- x 100-ft. footprint consumed 170 truckloads of ready

mixed at a pace of 20 trucks/hour, or one truck every three minutes, pouring more than 6.6 million lb. of material into the 15-ft.-deep pit. Three pumps ran continuously throughout the 10-hour pour.

With cement purchased from Cemex and Holcim, as well as fly ash in the mix design, Lafarge supplied ready mixed for the floor slabs. The mix also included Lafarge's early-strength specialty product Chronolia, which made it possible to reach strength in 24 hours to accommodate the post-tensioning schedule. —by Steven Prokopy



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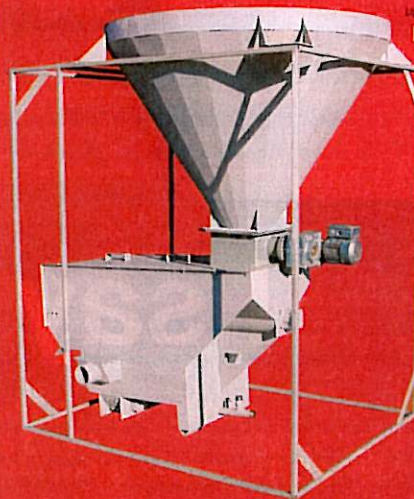
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