

Unique deck system speeds up Lincoln Square

■ *Column-hung forming system increases the speed of deck construction by nearly 30 percent.*

By **TIM O'NEILL**
and **LEON BORDEN**
Skanska

An advanced concrete deck system recently introduced to the Puget Sound region is shaving weeks of construction time

off a major mixed-use project in downtown Bellevue.

The column-hung forming system is so time- and cost-efficient that it is poised to change the way Northwest high-rises are built for years to come.

The system, mostly used on

hotel projects in Las Vegas and other markets around the country, had never been used in this area until late last year when Skanska deployed it at the Lincoln Square project.

Unlike traditional horizontal forming systems, the column-hung system's equipment eliminates the need for re-shoring, which can significantly delay a project's construction cycle by closing off floors to trades or storage due to load consider-

ations. With the column-hung system, builders and subcontractors — including mechanical, electrical and plumbing workers — have almost immediate access to lower areas of the building while concrete slabs are being set, poured and stripped on the floors above.

The result is a nearly 30 percent increase in productivity for deck construction and a significant decrease in labor costs.

These safe, affordable systems

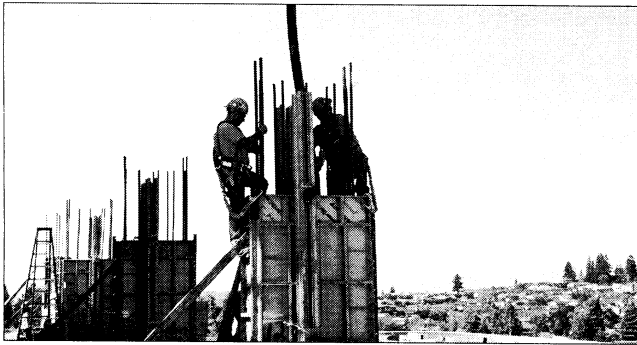
are available through numerous suppliers, including Toronto-based Aluma Systems.

Fast floors

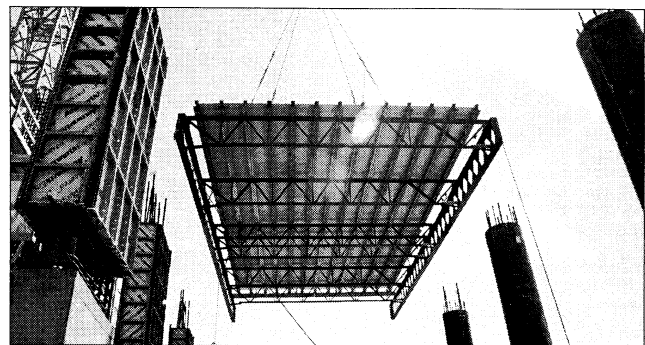
While column-hung forming systems aren't appropriate for every project — they work best for symmetrically shaped buildings with repeatable floor plans and columns spaced equally apart — they were ideal for Lincoln Square.

Aluma Systems' Hi-Flyer Col-

How to build a floor in 6 days



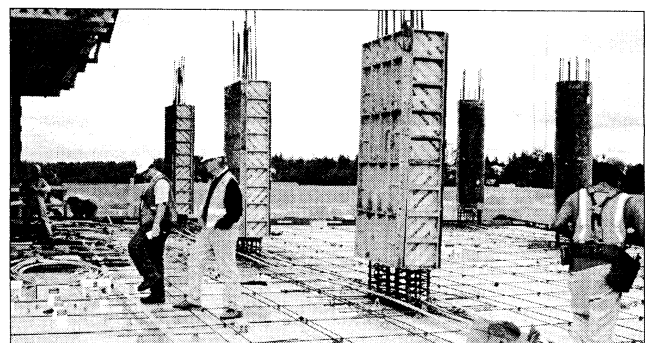
Day 1 – Columns are set and poured on a slab that was poured the previous day.



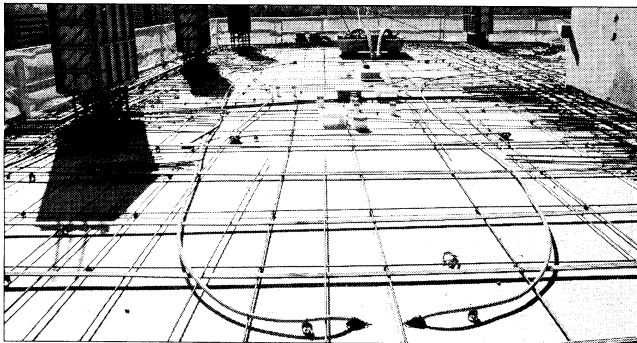
Day 2 – Tables are flown while crews strip column forms and install column jacks. Workers also set filler strips and begin forming the edges.



Day 3 – Subcontractors begin sleaving and roughing-in mechanical, electric and plumbing to the slab. Rebar work starts.



Day 4 – Rebar and post-tension cable work continues.



Day 5 – Ironworkers and electricians complete their work.



Day 6 – Concrete is poured.

Photos courtesy CDS Inc.



Borden



O'Neill

umn Hung Shoring System is helping Skanska cycle a new floor every six days at the two-tower condominium, hotel, retail and office development.

This is a significant improvement to the project's previous building cycle, which averaged a floor every two weeks using a traditional table-truss system on the first six floors of the project's

south tower. The Hi-Flyer is being used for floors seven through 42 of that tower. The project's north tower, for office space, is on hold until demand picks up for that market.

The decision to jettison conventional shoring equipment was made more out of necessity than convenience. When Kemper Development Co. bought Lincoln Square last fall, the project had been inactive for several months after a series of owners and contractors took turns at developing it.

Bellevue-based Kemper collaborated with Skanska on how the new team could compress the building cycle by as much as three weeks and complete the project in 22 months. The accelerated construction schedule will allow Kemper to open the project's hotel and retail component in November and welcome its first condominium tenants less than 19 months after the start of construction.

Tweaking the system

Managers in Skanska's Seattle office were familiar with how the system worked, but needed more information on how it could be used at Lincoln Square. They visited a number of construction projects that were using Aluma Systems equipment in Las Vegas, where many buildings are uniquely suited to it.

While Lincoln Square's original architectural plans accommodate the column-hung system to a point, several logistical obstacles had to be addressed through careful planning, modifications to the way the system is used, and scheduling and resource allocation at the work site.

For instance, floors on the tower's core do not have columns and their pre-set walls prevent the column-hung system from being flown by cranes that "pick" the system from underneath each completed floor. To remedy the situation, a re-shoring system is being used for the areas where the core

walls take the place of columns and inside the tower's core.

Also, during the cooler winter months, columns were poured a full day after the floors to give the horizontal slabs sufficient time to cure. A schedule was developed that make up the time in other areas of construction.

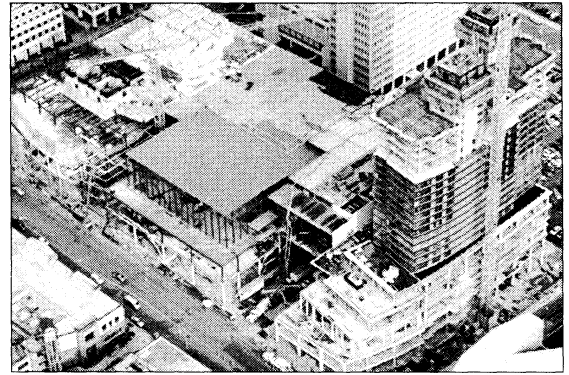
Skanska consulted with structural engineer ABKJ and Kemper to determine how the project's 12,000-square-foot floors could be created in a single pour to save on materials, labor and time. Previous contractors poured the floors in a two-step process.

The solution: Two complete sets of column-hung floor forming systems were assembled, allowing workers to meet time constraints and providing additional assurance in case of delays caused by concrete not curing fast enough.

The Aluma forming system requires limited fabrication and assembly time, but it does command great attention to detail from the construction team. In addition, since the column-hung equipment weighs more per square foot than traditional shoring systems, it requires a higher-capacity crane to lift the tables.

Flying tables

Each floor at Lincoln Square consists of 12 tables constructed of aluminum beams and transverse trusses supported by two 32-foot-long Castelite beams. The tables are placed together



The decking system is being used on the south tower, foreground, of Lincoln Square. Photo by Soundview Aerial Photography

and mounted on jacks attached to the columns using a 1.25-inch-diameter coil rod. Since each table weighs in excess of 14,000 to 16,000 pounds, a special crane — a 420 Liebherr — and chain hoist are being used to keep the tables level during the flying operations.

The jack supports, in combination with the high-capacity crane and a special power winch designed for the Lincoln Square project, enable the form tables to roll out, or "fly," to the next level after slabs are cured.

In the real estate development business, time is money. That's why it is critical for developers and their contractors to identify every available way to shorten building cycles and

bring projects to completion as fast as possible. The column-hung forming system is doing just that at Lincoln Square. It has been so effective that Skanska and Kemper anticipate a full opening less than two years after construction began.

Both companies believe that the column-hung system will soon become commonplace on area high-rise projects for decades to come.

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