

Historic Parking Garage

Special project sets new standard for concrete technology

The concrete set up uniformly, finishing, float work, and operations to be completed on of each deck while pouring on the other end.

Use of new sophisticated concrete mixing technology helped to complete a six-level Minneapolis parking garage project in record time.

With only 365 days allotted to the construction of a 1,800-vehicle, post tension parking garage, concrete specifications called for a high early and extremely innovative concrete mix.

In fact, each deck pour of the total 22,000 yards of concrete used in the project was required to meet or exceed 3,000 psi within 18 to 24 hours.

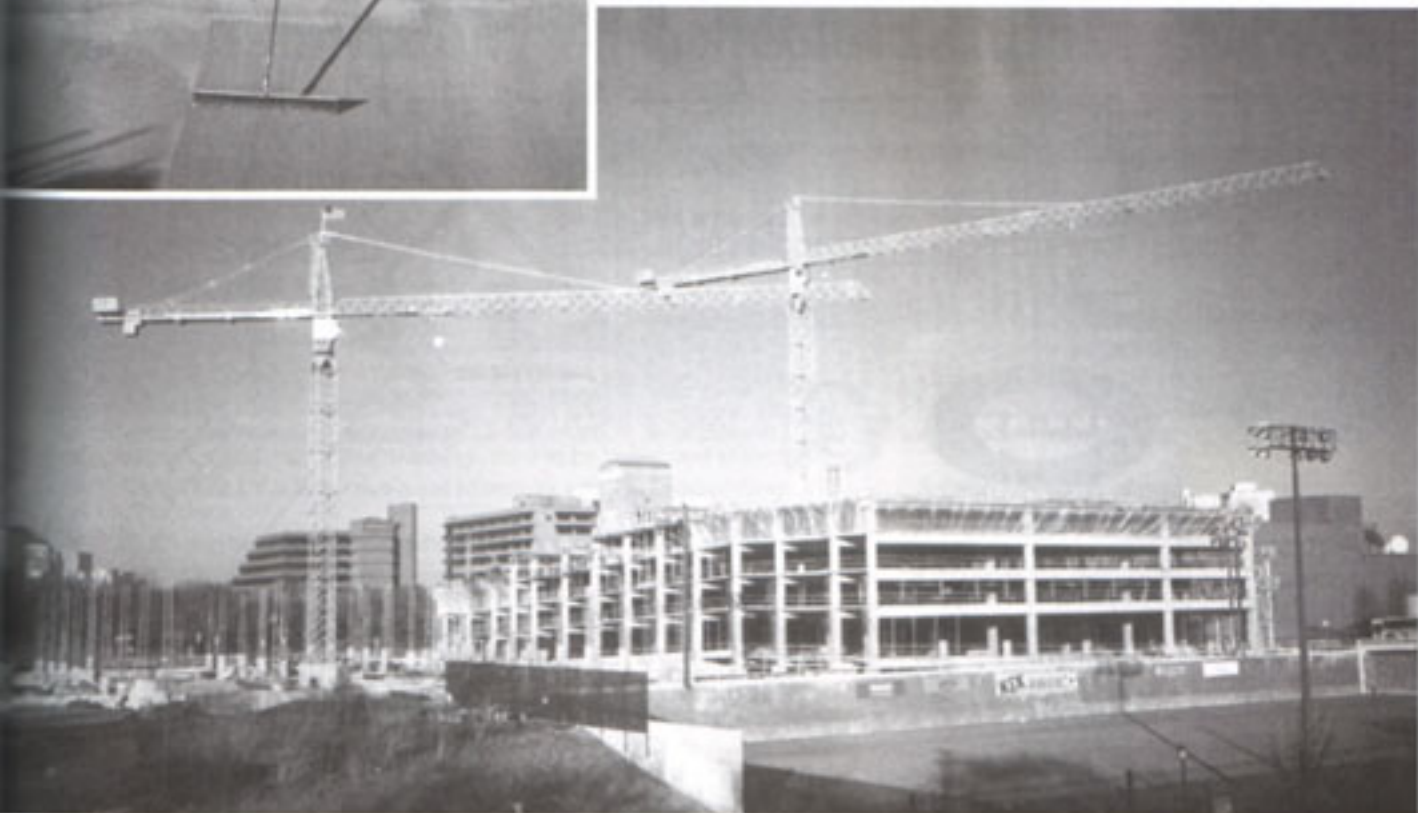
The assignment was to create a mix utilizing Type II cement that would achieve strength within 18 to 24 hours (rather than the typical three days).

Further, the mix also had to minimize shrinkage while not compromising quality.

Located adjacent to the Wells Fargo Mortgage Division offices in Minneapolis, the garage project was on a fast track from Day One. From architectural drawings to completion, the job was to last one year and not a day more.

General contractor M.A. Mortenson Company was faced with producing a concrete structure that retained its strength while cutting its drying and finishing times.

Below: Contractor M.A. Mortenson Company was able to bring complex Wells Fargo parking garage in Minneapolis in ahead of schedule.



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A team of construction specialists was put to work to come up with a successful combination of corrosion inhibiting and superplasticizing chemicals that met the project owner's strict schedule and quality requirements.

Key ingredients were Cortec Corporation's MCI-2005 NS, a liquid admixture to provide corrosion protection and

Educacon Technologies' Enduracon HR, a liquid superplasticizer that achieves early strength, workability, and predictable setting times.

The mix of corrosion inhibiting and superplasticizer was designed to tackle the 3,000-psi strength requirement while reducing the finishing time as much as possible.

"This was a new mix of chemicals specially designed to meet tough challenges," said Larry Nelson, president, Enduracon Technologies.

"Attempting to impact finishing times was our real goal, but we had to carefully balance that with the need for strength, no increase in shrinkage, and a quality finish.



Concrete pumping company E-Con-Placer reported that the pioneering mix, while low in water content, flowed easily and consistently.



E-Con-Placer's president, Rob Tousignant, said the concrete mix enabled his firm to pump at lower pressures, providing a productivity increase.

"That is a complicated balancing act, but we are very happy with the results."

The concrete mix was low in water content, yet it flowed easily and consistently.

The combination of MCI-2005 and Enduracon HR allowed the concrete to set so uniformly that finishing, float work, and brooming were able to be completed on one end of each parking deck while pouring continued on the other end.

"Even with the low water content, the mix exhibited excellent finishing properties, and the need for an evaporation surface retardant was very minimal," said Nelson.

The parking garage is next to the newly renovated home of the Wells Fargo Mortgage Division offices in the Phillips neighborhood of Minneapolis.

The structural engineering firm of Meyer, Borgman and Johnson, Inc.

guided the project. Concrete for the job was supplied by Aggregate Industries.

"Independent test data," said Mike Ramerth, structural engineer with Meyer, Borgman & Johnson Inc., "indicates that the MCI 2005 NS provided effective corrosion protection with no increase to the shrinkage potential of the mix design."

Mike Anderson, M.A. Mortenson Company superintendent, remarked that the products performed well "and have higher strength-gaining properties using Type III cement."

Concrete for the project was pumped by the firm of E-Con-Placer. "The Enduracon HR superplasticized concrete provided our pumps with a workable, fluid, and cohesive mix," observed Rob Tousignant, president of the firm. "This mix enabled us to pump at lower pressures, providing a significant increase in productivity."

"We're thrilled that innovative mix technology contributed to the cost-effectiveness of the project," Nelson observed. "We're in the business of producing a great product, but, more than that, we're happy to help our clients to deal with the problems of time, money, and resources."

Enduracon Technologies Inc., St. Paul, routinely manufactures chemical admixtures for concrete mixes. For this project, Enduracon HR was used specifically to reduce the water content, improve the workability and flow, enhance the cement's performance, and maintain a predictable set time.

Cortec Corporation, St. Paul, supplies mitigating corrosion inhibitors that provide long-term protection for steel and other materials in finished concrete. MCI-2005 NS was used in this project to protect the reinforcing steel from any corrosion that may be induced by road salt or similar destructive elements. □