

Elk Grove High School Natatorium Elk Grove, Ill.

Both structural precast, pre-stressed concrete and architectural precast concrete members were used very effectively to build an attractive, two-story, 32,000 ft² (3070 m²) swimming pool facility for a well-known high school in a northwest suburb of Chicago.

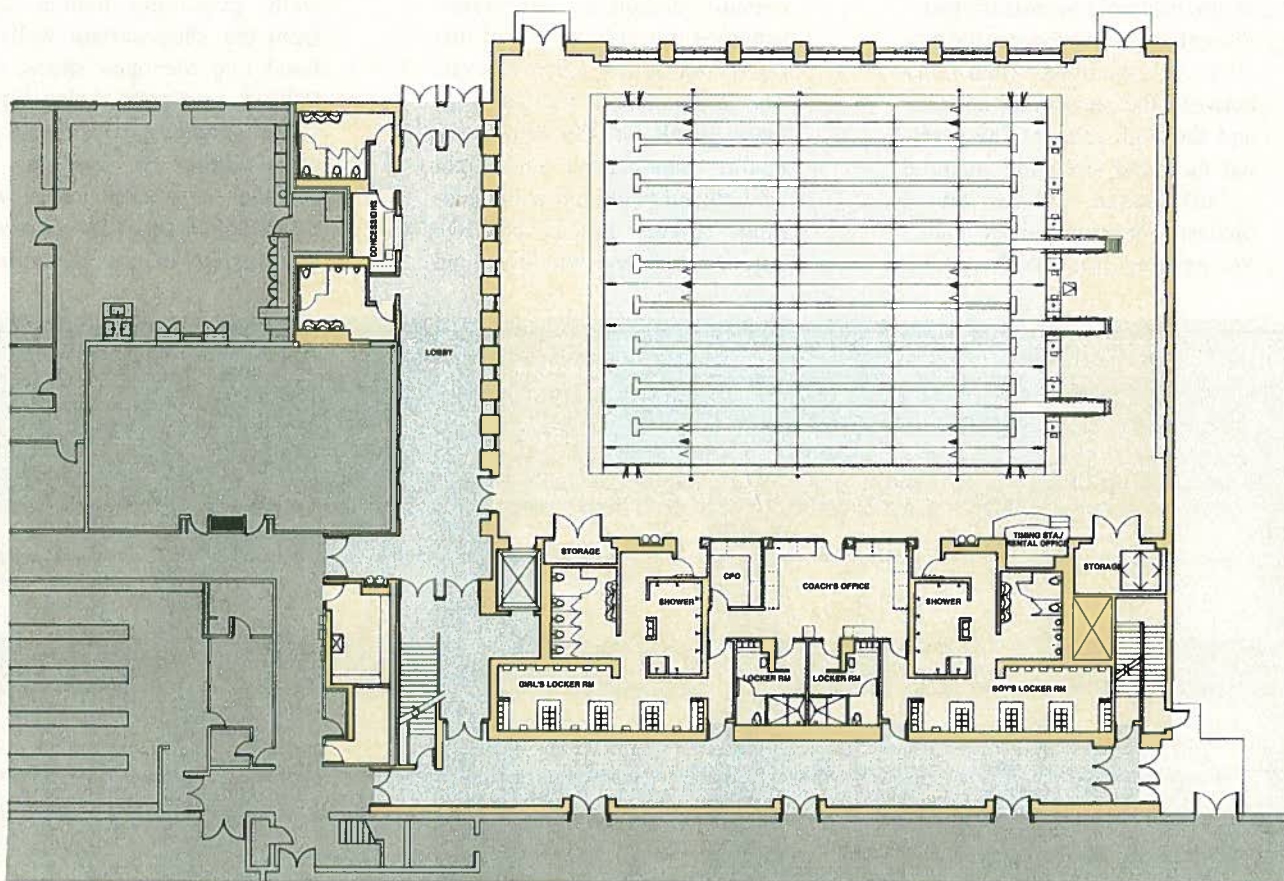
Elk Grove High School in Elk Grove, Ill., has a long history of excellence in both academics and athletics. One facility that the school lacked was a first-class natatorium for its competitive swimming meets with other schools and its own physical education swimming programs. In addition, such a swimming pool was needed in community education and recreation programs.

To fulfill this need, Township High School District 214 (the owner) turned to architects STR Partners, LLC of

Chicago to design this facility. The functional requirements (size, capacity, dimensions of swimming pool, etc.) were fairly straightforward, but a decision had to be made regarding the type of material to be used for the structural framing of the natatorium and the method of construction. This was important, not only for functional reasons, but also for aesthetic and quick occupancy purposes.

After considering several alternative building materials, it was decided to use structural precast, prestressed con-





Elk Grove High School Natatorium Floor Plan (Yellow denotes addition)

crete for the main frame of the building and architectural precast concrete for the building's shell. Joining the architect on the design team was the engineer of record, CS2 Design Group of Elk Grove, Ill., which was responsible for the structural design and analysis of the building. The contract for the project was awarded to Pepper Construction of Barrington, Ill.

The precaster, J. W. Peters and Sons of Burlington, Wis., worked almost from the beginning of the project with the design team. During the course of the project, the precaster contributed several cost-saving ideas. Assisting the precaster was the precast specialty engineer, Precast Engineering Company of Waukesha, Wis., which provided engineering services, including the shop drawings for the precast portion of the project.

The architect's solution was to provide a two-story, 32,000 ft² (3070 m²) natatorium addition to the school



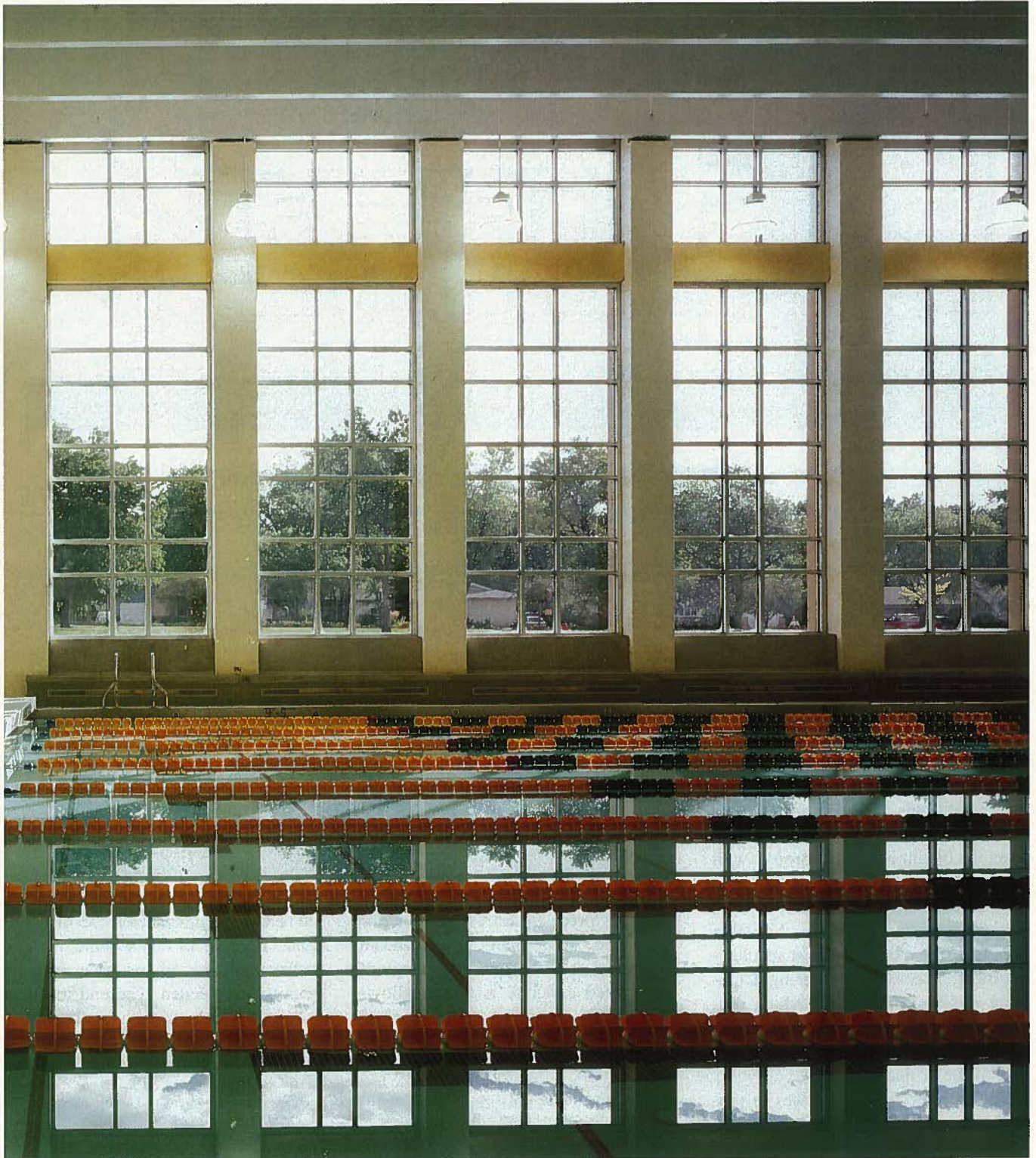
using a precast/prestressed concrete frame (see floor plan). A significant functional and structural advantage of prestressed concrete is that it allows long-span construction. In this particular project, single prestressed concrete

tee beams spanning 114 ft (35 m) were used.* Because of this scheme, thinner walls could be used and fewer support beams were needed. The end result is a spacious interior with unobstructed views of the swimming pool.

*Readers might wonder why single tees (rather than the more common double tees) were used to span the roof of the natatorium. The reason for this choice is that typical 28 or 32 in. (711 or 813 mm) deep stems do not have the flexural capacity to span such a long distance under relatively heavy snow load and roof weights. Thus, special 60-in.-deep (152 mm) single tee forms were used.

The visual advantages of precast concrete are threefold for this project:

- The primary advantage is the creation of a seamless visual unity between the natatorium addition and the high school. The external face and structural material is buff colored, and the vertical precast concrete panels match the existing brick high school;
- Another visual advantage is an overall attractive appearance achieved through the use of different treatments and elements. The architectural precast concrete panels of the natatorium feature sandblasted and light acid-etched treatment with decorative reveals. Precast concrete columns between windows lend
- a “monumental” appearance while permitting natural light from the glass curtain walls to flood into the open space; and
- Precast concrete also provides a strong visual advantage within the building. It achieves a smooth, clean, aesthetic appearance that enhances the interior of the natatorium.



In addition to its visual benefits, precast concrete possesses another important advantage, namely, the ability to withstand the corrosive, high-chlorine environment of a swimming pool facility. Because of its composition, precast concrete is highly resistant to chlorides, so it provides long-lasting durability.

The structural precast, prestressed concrete components comprised twenty single tees, 6 ft wide $\times$ 5 ft deep (1.8 $\times$ 1.5 m), spanning a clear distance of 114 ft (35 m).

The architectural precast concrete components comprised:

- Thirty-two panels: 12 ft wide $\times$ 36 ft high $\times$ 12 in. thick (3.7 m $\times$ 11 m $\times$ 305 mm)
- Eight columns: 2 ft 4 in. wide $\times$ 2 ft 6 in. deep (640 mm $\times$ 760 mm) with a height of 36 ft (11 m)
- Seven beams: 2 ft high $\times$ 12 in. deep (610 mm $\times$ 305 mm), spanning 9 ft (2.8 m)

Both insulated and non-insulated architectural precast concrete panels were used.

The structural and architectural precast concrete components were manufactured by J.W. Peters and Sons at its plant in Burlington. Precast concrete components were shipped by truck trailer to the project site—a distance of about 150 miles (240 km). The precaster was responsible for both the transportation and erection of the precast concrete products.

Design of the project began in May 2003. Fabrication of the precast products took place in October and November 2003, and erection of the building followed in December 2003. The facility was opened in August 2004, in time for the fall swimming programs.

The total price of the project was \$6,868,587, while the total price of the precast concrete package was \$759,959.

The owner, design team, contractor, and precaster are pleased with their selection of precast/prestressed concrete as the principal building material and the final outcome of the structure—both in functionality and attractiveness. For this project, quick



assembly of the precast concrete components facilitated a fast turnaround time that accommodated the owner's tight schedule and realized significant cost savings. Precast/prestressed concrete construction made these scheduling and cost benefits possible. The facility was completed and ready for the upcoming school year—on time and within budget.

The facility has now been operating with total satisfaction for the past 18 months. The swimming coaches, swimmers, students, and community are all very satisfied with the natatorium and are enjoying their new facility.

CREDITS

Owner: Township High School District 214; Arlington Heights, Ill.

Architect of Record: STR Partners, LLC; Chicago, Ill. (Michael T. Henderson, AIA)

Engineer of Record: CS2 Design Group; Elk Grove, Ill.

General Contractor: Pepper Construction; Barrington, Ill.

Precaster: J.W. Peters and Sons; Burlington, Wis.

Precast Specialty Engineer: Precast Engineering Company; Waukesha, Wis.

Photography courtesy of Steve Hall at Hedrich-Blessing.

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