PCI items

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The Stadium

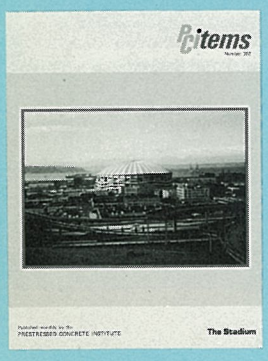
The precast prestressed concrete stadium: ready for kickoff when you are

Rapid, trouble-free assembly using a minimum of site space helps make precast prestressed concrete the material of choice for stadium construction—even on a tight, between-seasons schedule. Units precast and stored at the plant do not interfere with use of existing track and other facilities. Speedy completion means lower costs for interim financing, and earlier income.

Prestressed concrete units are lean and tough. Although strong and stable enough to stand dynamic loading from shifting crowds, their shallow structural depth improves sightlines and permits visually dramatic structural effects. Dense, durable surfaces easily withstand weather, vigorous cleaning, and vandalism. In roofed structures, long spans reduce the number of columns. And concrete's low thermal conductivity reduces heating and cooling costs, in spite of the often huge volume enclosed.

Economy is an important benefit, for local school board or megalopolis. Standard products lend themselves to repetitive use with little or no modification, resulting in all the economies of mass production. Plant quality control means a surface which needs no finishing to provide an attractive, festive setting. Long-range costs such as maintenance and fire insurance are minimal. If you plan for expansion, demountable connections and easily-obtained, factory-matched units make the job simple and economical.

In fact, when it comes to stadiums—and most other buildings and structures—precast prestressed concrete is ready when you are.



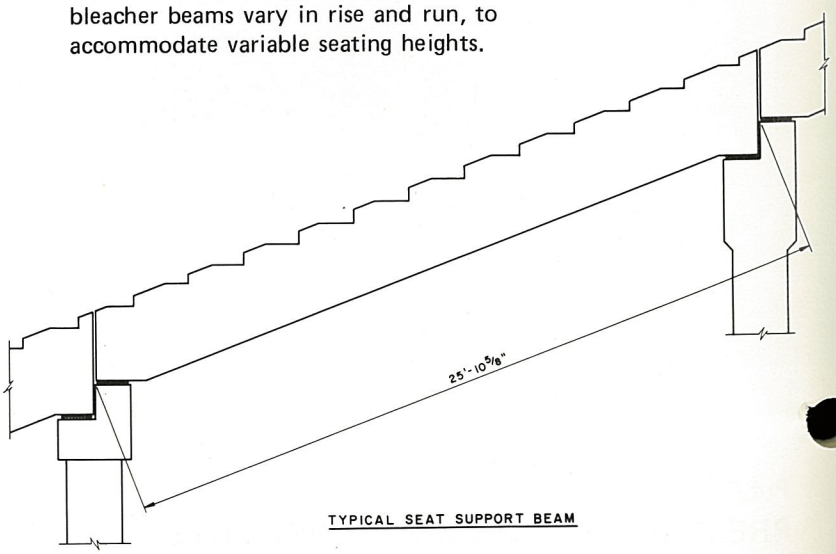
On the cover is the King County Domed Stadium in Seattle, described on pages 4 and 5.

Unusual design parameter? Adaptable precast prestressed concrete is the answer

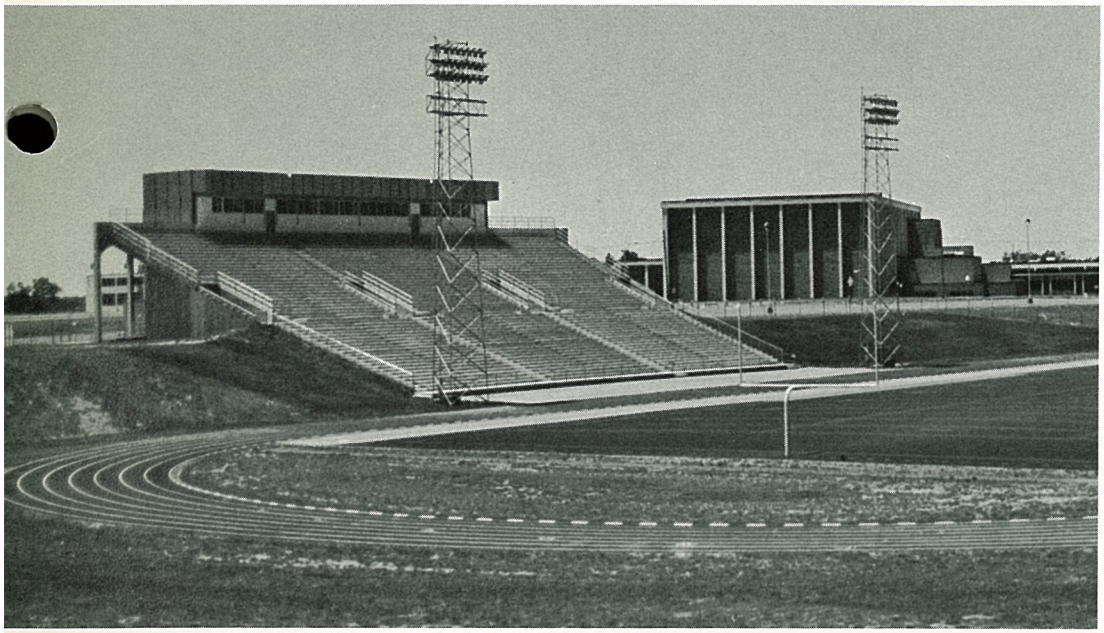
For the Missouri Southern State College Stadium at Joplin, designers wanted to enhance appearance and improve spectator sight lines by slightly curving the seating both horizontally and vertically, like a fan or sea shell. This meant variable bleacher beam and bearing layouts, with variable notching lengths and depths. Quality control at the precasting plant yielded just the right product, accurately molded to a variety of shapes. Says the architect/engineer: "Close cooperation in office and field by the design and construction teams, including the precaster-erector, assured an amazingly accurate and swift solution to an intricate construction problem."

Other benefits of prestressed concrete include durability in the face of the elements and vigorous cleaning; strength and stability to withstand dynamic loading from exuberant crowds; fire resistance for bleachers over the concession area; pleasant colors and exposed aggregate, providing a handsome, festive backdrop for sporting events; economy; and expedited production to meet a tight schedule for the season opener.

This detail shows how notches in the bleacher beams vary in rise and run, to accommodate variable seating heights.



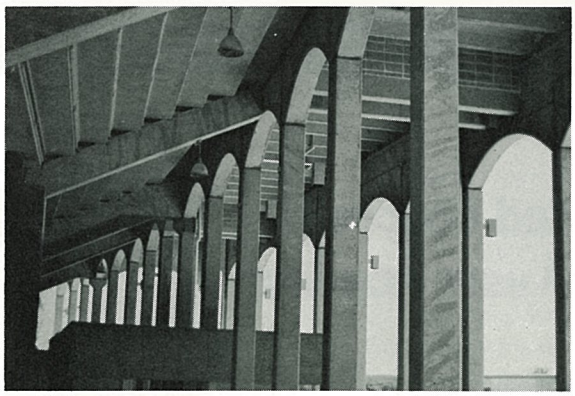
TYPICAL SEAT SUPPORT BEAM

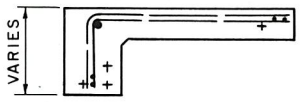


This photo shows the slight "fan" of the seating.

Architect/Engineer: Allgeier, Martin & Associates, Joplin
General Contractor: M-P Construction Company, Carthage, Missouri
Prestressed Concrete: Prestressed Casting Company, Springfield, Missouri

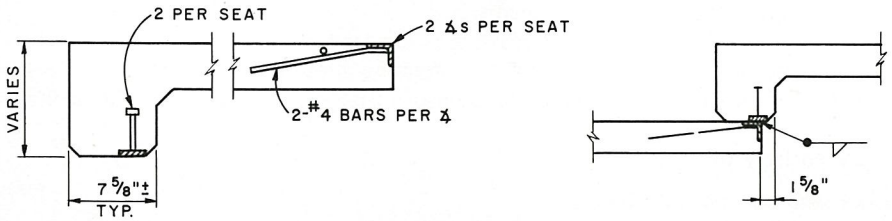
Precast prestressed units include bleacher, arch, rectangular, and "L" beams; seating sections; columns; double tee floors and roofs for press box, ramps, concessions, ticket booths, and rest rooms; fascia and wall panels; and removable, reusable seating end sections for future expansion.





USE 4 - 1/2" 270K STRANDS

TYP. REINFORCING FOR SEATS



TYP. SUPPORT CONNECTIONS FOR SEATS

Precast prestressed concrete spells economy for vast stadium

The King County Domed Stadium in Seattle seats up to 80,000 people in its enclosure of nearly ten acres. One of the largest concrete domes ever constructed (clear spanning 661 ft.) was made possible by prestressing, and most of the rest of the structure consists of precast prestressed concrete. Because designers made repetitive use of standard units, all the economies of mass production were realized. Speed and ease of assembly also contributed to holding costs well below those of comparable stadiums.

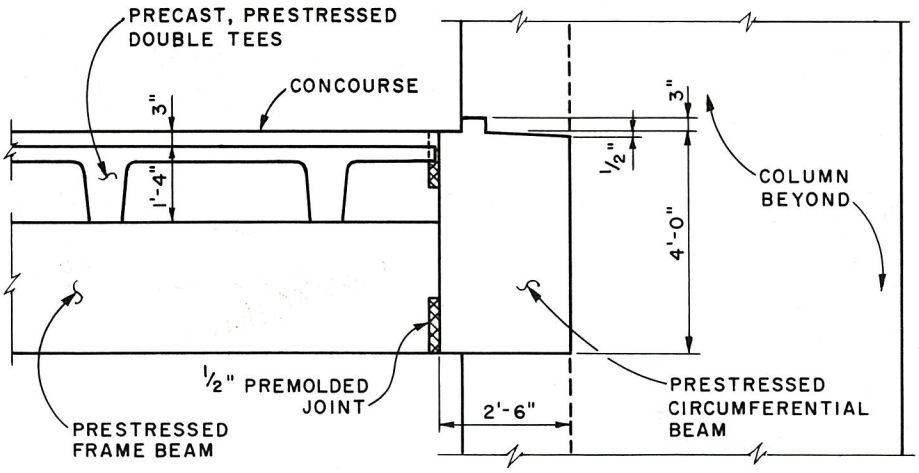
The seating, concourse, and ramps are entirely of precast prestressed concrete, as are most beams and much of the special framing for press boxes, passages to seating areas, and mechanical rooms. The concourse consists of hollow-core slabs with 3-in. topping. Ramp panels are double tees, also topped, carried by channel rail beams.

Precasting eliminated or reduced formwork and shoring. Prestressing allowed shallow structural depths which help ensure that there isn't a bad seat in the house.

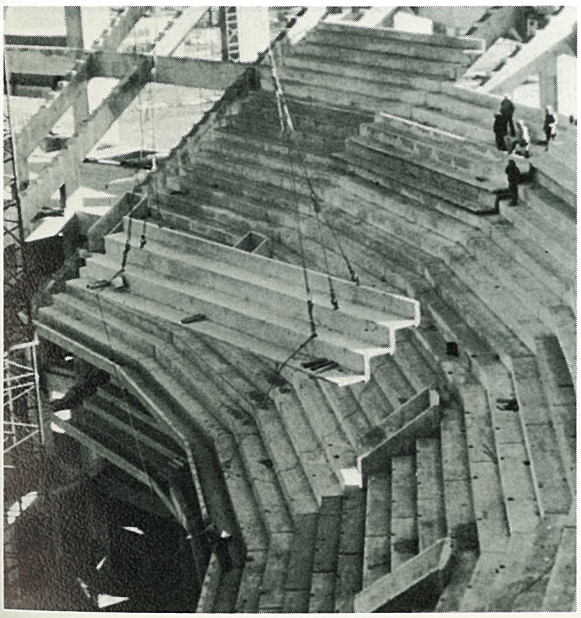
PRECAST PRESTRESSED COMPONENTS:
- 1063 seating slabs
- 1048 double tee concourse panels
- 2588 hollow-core ramp panels
- 254 ramp rail beams
- 40 ring support beams
- 200 hollow-core deck panels
- 493 miscellaneous beams

PRECAST COMPONENTS:
- 340 vomitory walls & slabs
- 2407 step units

PRESTRESSED COMPONENTS:
- 80 circumferential ring beams
- 720 radial frame girders
- 40 ring support beams
- 19 tension ring slabs



This section shows circumferential and frame beams, with concourse tees resting on the latter.



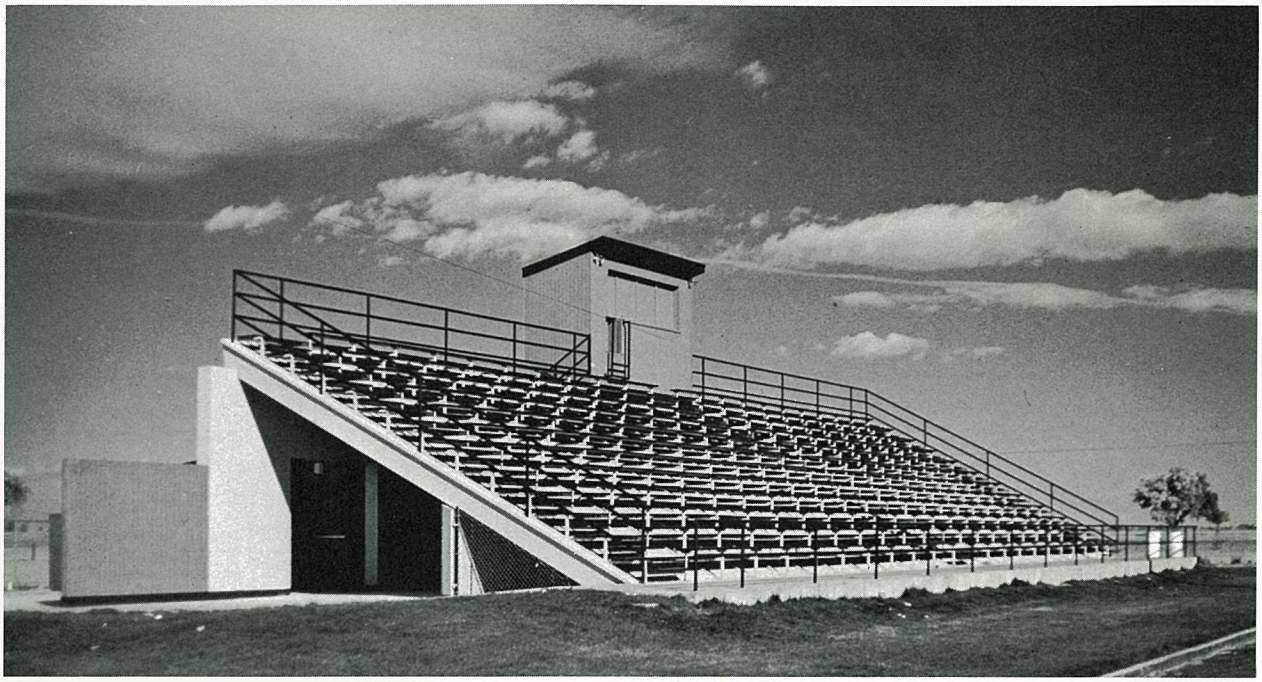
Architect: Joint Venture: Naramore, Bain, Brady & Johanson/Skilling, Helle, Christiansen, Robertson, both of Seattle/Praeger, Kavanaugh & Waterbury, New York City

Structural Engineer: Skilling, Helle, Christiansen, Robertson, Seattle

General Contractor: Peter Kiewit Sons' Co., Seattle

Prestressed Concrete: Associated Sand & Gravel Co., Inc., (subsidiary of Hydro Conduit Corp.), Everett, Washington; Central Pre-mix Concrete Co., Kent, Washington

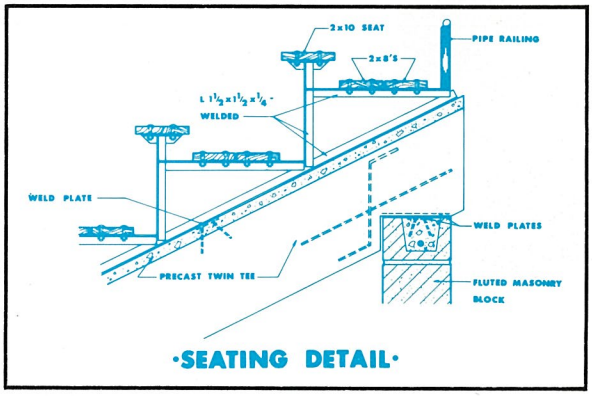
Three-tread seating element being lifted into place. A total of 37,000 lin. ft. of these units each measure up to 54 ft. long and weigh 38,000 lb. They were cast upside down in nine self-stressing forms to ensure dense concrete on the seating side, then rotated 180 deg. for destressing.



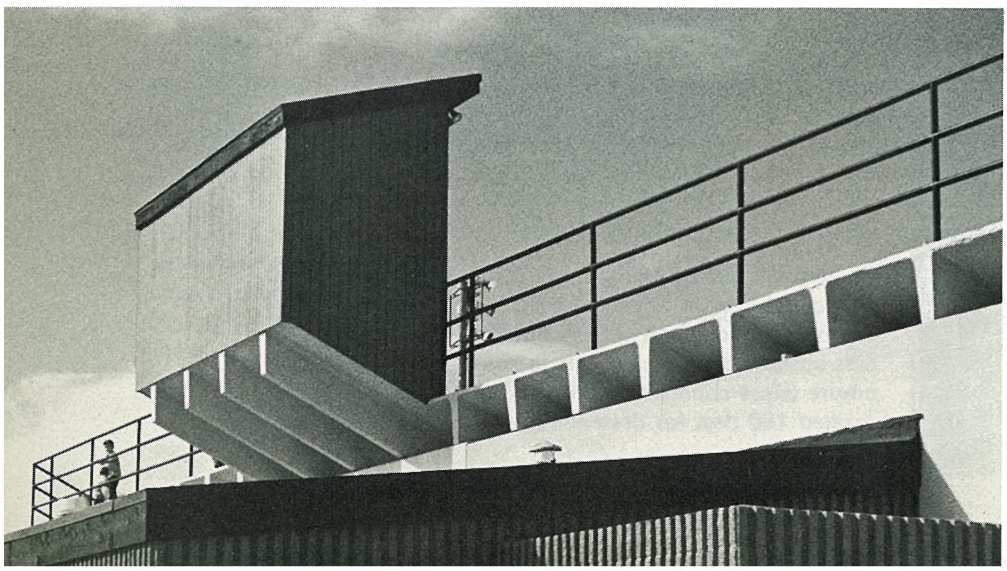
Easy maintenance using precast prestressed concrete

The Platte Valley Stadium at Kersey, Colorado, takes full advantage of the dense, durable surfaces of precast prestressed double tees. Together with their clever arrangement, these easily-maintained surfaces avoid the water-staining that may plague tiered outdoor seating. The tees are set at a 26-deg. slope. Joints are caulked and the entire surface painted. A "stair step" assembly of wooden seat planks and steel angles is welded to steel plates cast into the tees (see drawing). This arrangement provides for excellent drainage; in fact, seats and sloping deck may simply be hosed down for cleaning.

The underside of the tees is painted also, providing a pleasant covered concourse beneath the seats. The architects note that "construction proceeded at a good pace, with erection of the double tees very rapid and trouble-free."



·SEATING DETAIL·



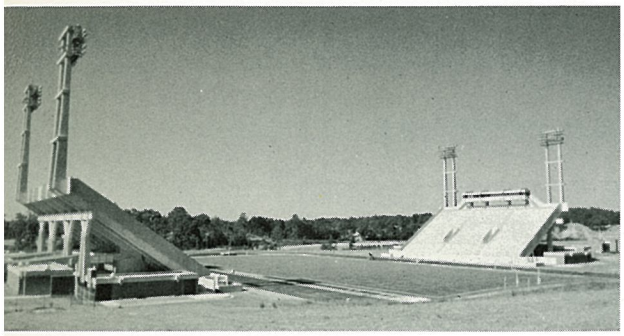
Architect: Johnson, Steel, Williams, Greeley, Colorado
Structural Engineer: Richard Weingardt Consultants, Denver
General Contractor: George Bargelt & Co., Inc., Greeley
Prestressed Concrete: Stanley Structures (Wyoming Prestress Company), Cheyenne, Wyoming

The two center tees are cantilevered to support a press box, out of spectators' line of sight.

Plan for expansion with precast prestressed concrete

Lakewood Stadium in Atlanta seats 6000, but a total of 10,000 seats is planned. Precast prestressed concrete was chosen for the ease and economy of obtaining and assembling additional factory-matched components. Economical prestressed seats were cast in double-tee beds with the flanges blocked back to the 14-in. stem, which became the riser. To achieve the look of a steeper slope, curbs were built up adding about 4 in. to the riser. Side walls are made up of 6-in. thick precast parallelograms.

The architects used the shapes of structural units dramatically and harmoniously. Their structural "sculpture" combines projecting, cantilevered, and shaped ramp supports, Y supports, cantilevered press box, and integrated light towers.



Architect/Engineer: Robert and Company Associates, Atlanta
General Contractor: Batson Cook Company, West Point, Georgia
Architectural Precast and Prestressed Concrete: Macon Prestressed Concrete Co., Jonesboro, Georgia

Architect: "Speedy construction with precast prestressed concrete meant savings for my client"

The 280,000 sq.-ft. Coliseum at Richfield, Ohio, is a sports and entertainment complex seating 22,500. The amount of precast and prestressed concrete used in the project is roughly equal to the concrete in a roadway 5½ miles long. Walls and floors are double tees. Among other precast units are over one hundred loges with bath and kitchenette, placed in a two-story bank around the perimeter.

The architect points out that "the speed of construction permitted by precast concrete meant savings to my client, decreasing interim financing cost and allowing earlier profitable occupancy." Also important were the high-quality surfaces of the exposed precast structural units, and the ease and precision of joining them.

Architect: F.M.B. Co. Architects, Braintree, Massachusetts

Structural Engineer: Arthur F. Chapin, Norwood, Massachusetts

General Contractor: William Passalacqua, Builders, Cleveland

Prestressed Concrete: Concrete Masonry Corporation, Elyria, Ohio

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