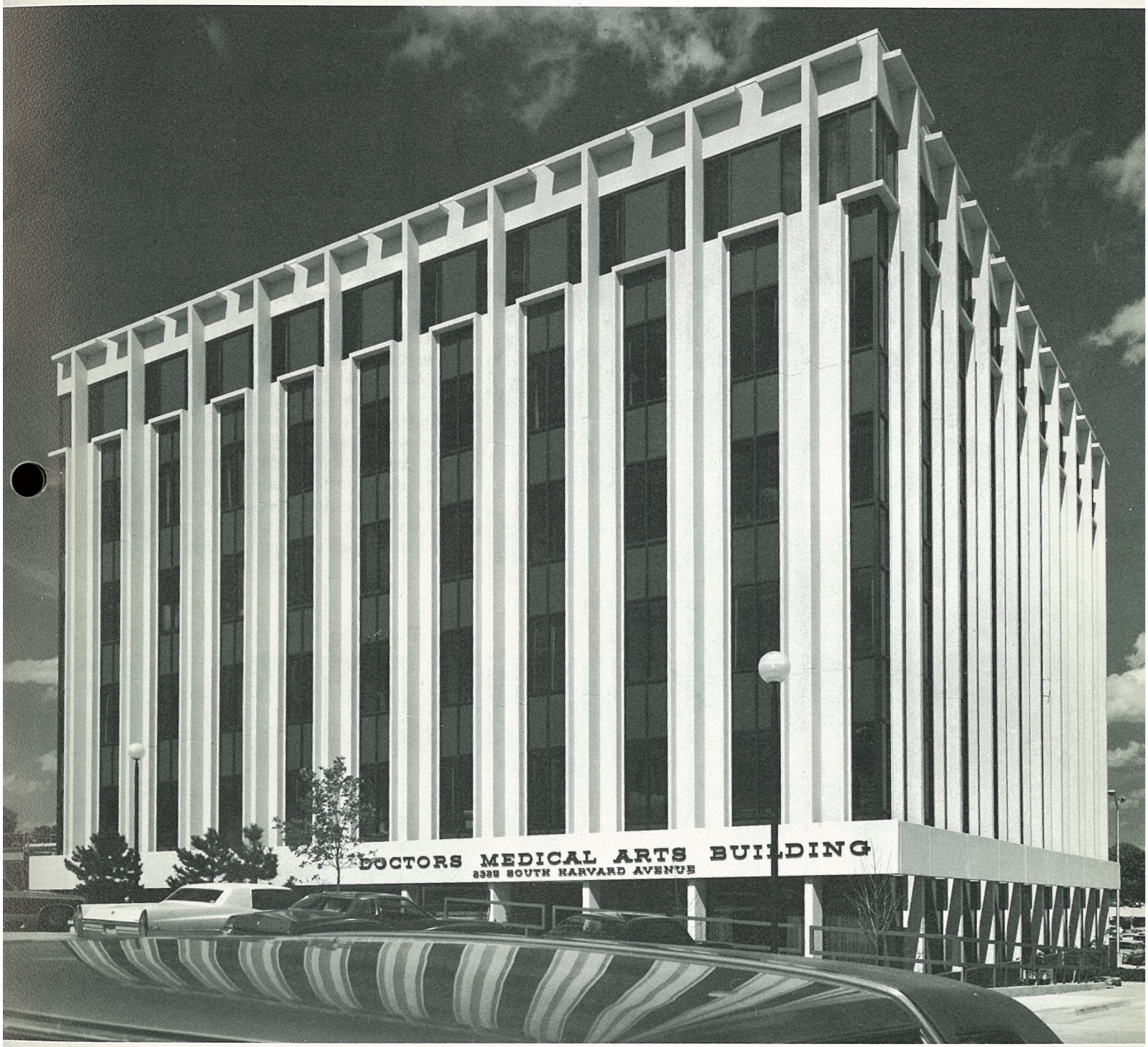
PCitems

Number 356



Published monthly by the
PRESTRESSED CONCRETE INSTITUTE

Medical Buildings

The precast prestressed concrete medical building satisfies human and technological requirements

Whether it's used for an office building or a vast multipurpose health center, precast prestressed concrete has much to offer today's medical practitioner, his patients, and staff.

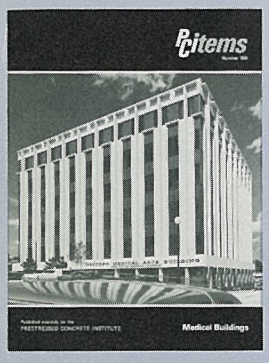
The enormously complex electrical and mechanical services necessary to the modern hospital and laboratory may be integrated readily within the depth of a precast prestressed concrete structural system. Voids in hollow-core slabs and the space between tee stems make excellent raceways for accessible, adaptable services, in the smallest possible space.

Such human requirements as fire resistance, sound, and thermal control are among the benefits of precast components. Should a fire start in a precast concrete room, it can often be contained there — so important where flammable substances are present, and patients difficult to move. The mass of concrete, along with hollow-core voids, reduces sound transmission.

Concrete's thermal resistance is easily enhanced by applied or incorporated insulation for an energy-efficient building, vital today from both the cost and conservation standpoints. The variety of shape and dimension available with precast concrete permits custom design of window units for sun control. Long spans are ideal for cantilevered overhangs shading large areas.

Often, simple exposure of factory-finished structural units creates a lively and attractive environment, easily and inexpensively maintained in its original condition.

Furthermore, value engineering reveals that precast prestressed concrete frequently offers the most economical solution for medical buildings of every type.



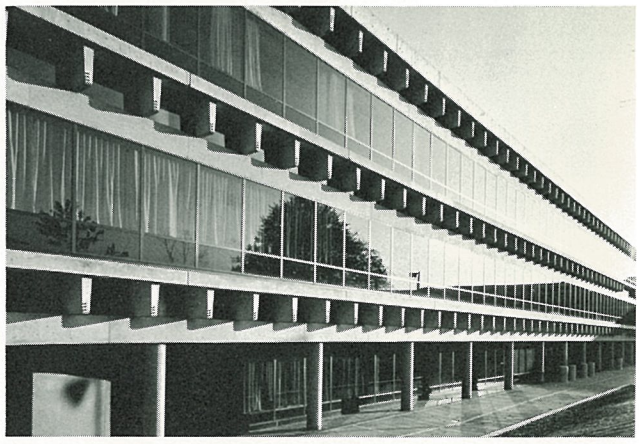
On the cover is Doctors Medical Arts Building in Tulsa, Oklahoma. Details on page 8.

Long-span prestessed tees lively, open interior for

The Capital District Psychiatric Center in Albany, New York, employs over 1000 double-tee units, covering 600,000 sq. ft. Facilities for treatment, education, recreation, administration, research, and services are housed in a four-story, chevron-shaped structure. These are joined to residential units by a three-story enclosed mall, decorated with colorful banners and containing shops, a chapel, and two auditoriums. Above the mall, 85-ft. tees cantilever 19 ft. to support a clerestory skylight. A roller assembly allows for expansion and movement at the junction of precast units with the glass.

Other tees vary from 30 to 60 ft. long. Their shallow depth of 18 to 28 in. contributes to the long, low appearance which blends with the residential neighborhood. The standardized, modular design permitted all tees to be cast in the same type of form, with only minor modifications, reducing production time and cutting

Tee stems form a pattern in the morning sun.



Architect: Joint Venture: E. Todd Wheeler; The Perkins & Will Partnership, White Plains, New York

Structural Engineer: Sol Marenberg Associates, New York

General Contractor: E. L. Nezelek, Inc., Johnson City, New York

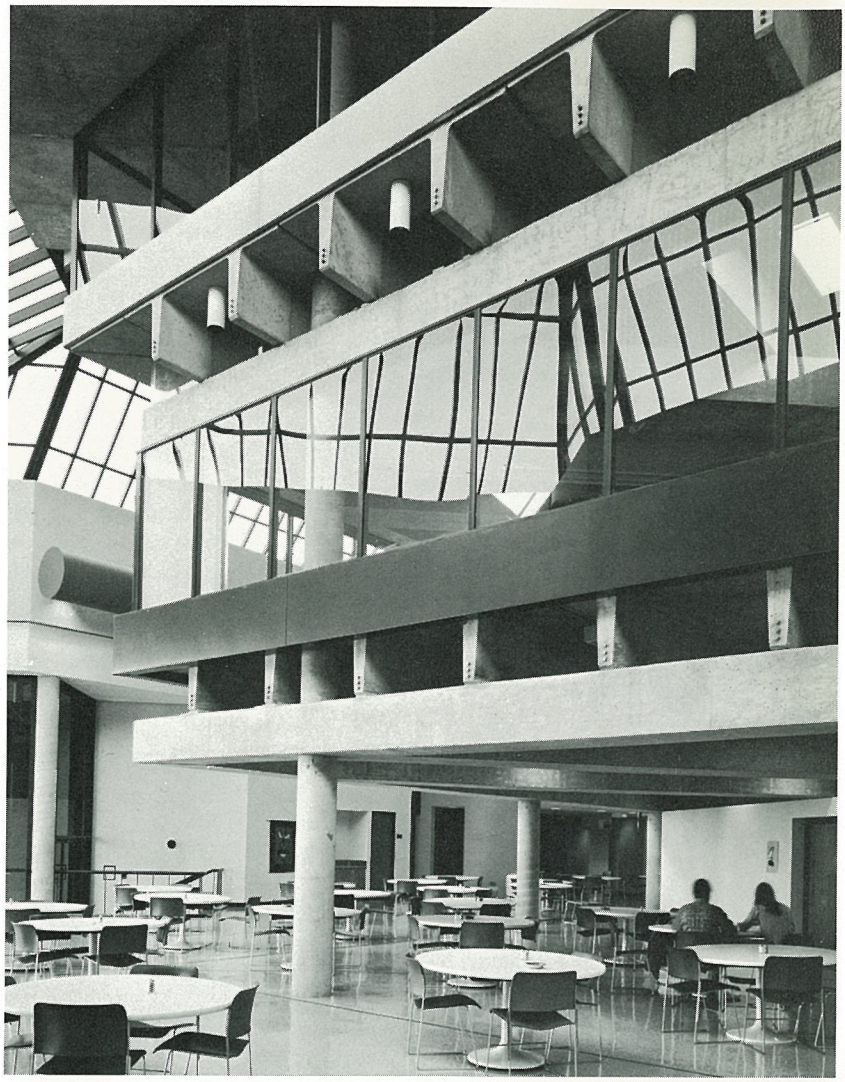
Prestressed Concrete: Unistress Corp., Pittsfield, Massachusetts

help create psychiatric center

costs. They are carefully coordinated with partition, lighting, and ventilation layouts. Continuous inserts in stem bottoms support and brace adjoining construction and services.

The mall floor consists of prestressed hollow-core slabs. Prestressed AASHO box girders were used in the loading dock. About 15,000 sq. ft. of flat architectural precast panels contribute to the face of the hospital building. To ensure a uniform warm tone, light gray cement from a single source was used. Because of weak clay soil at the site, loads were minimized with light-weight aggregate throughout the structure.

The architect notes that the use of precast concrete elements resulted in "an economical, fire-resistant, low-maintenance structure. Adaptability to short or long spans allowed flexible internal arrangement. The buildings are esthetically coordinated and structurally expressive, inside and out."



At these dining room stem ends, strands are fitted with stainless steel caps.

Architect praises high level of plant quality control in medical office building

A beautiful exterior exposed aggregate finish, which the architect attributes to careful plant quality control, distinguishes this unusual medical office building, the Scottsdale Medical Pavilion at Scottsdale, Arizona. A second benefit of top quality workmanship on a wide variety of precast units was ease and speed of erection, enhanced by close tolerances.

Precast prestressed concrete elements are: square columns, cast with haunches, in lengths up to 44 ft.; inverted T beams; and 51,500 sq. ft. of hollow-core floor slabs, 26 ft. long and only 8 in. deep. Also precast are a variety of wall panels, the largest measuring 12 x 47 ft., and planters for the attractive hanging gardens decorating walkways at each level.

Solar heat gain is a problem in Scottsdale. Glass curtain walls at each level were oriented to the north, with narrow vertical slit windows on the south. The largest surface of the building was sloped away from the sun's direct angle. Precast concrete's thermal resistance is a factor, as well. The net result is cost and energy savings. Dense concrete surfaces requiring little maintenance also help hold costs down.

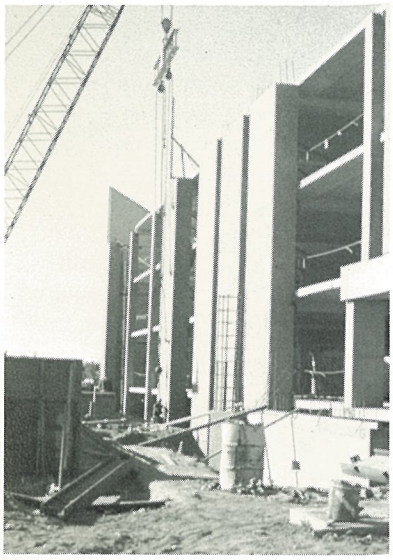
Architect: Michael & Kemper Goodwin, Ltd., Tempe Arizona

Structural Engineer: Caruso, Parke & Associates, Inc., Phoenix, Arizona

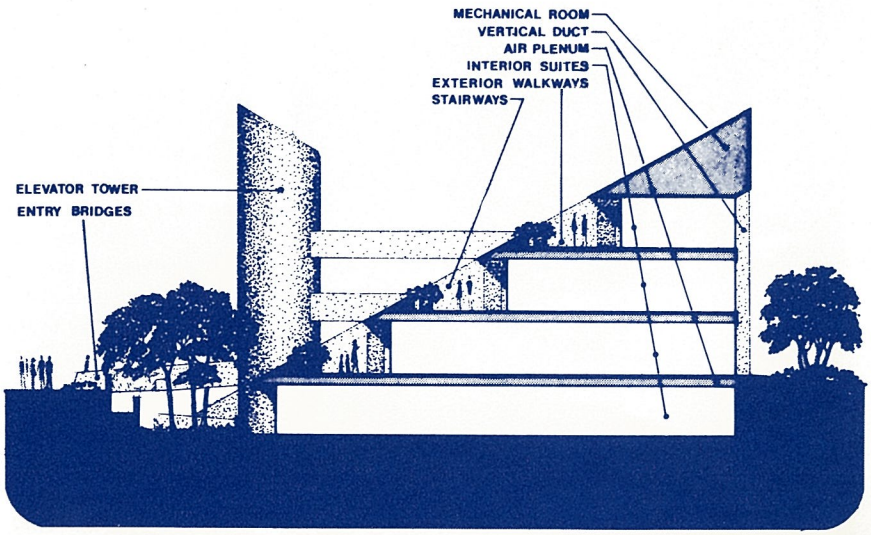
General Contractor: Redden Construction Company, Phoenix

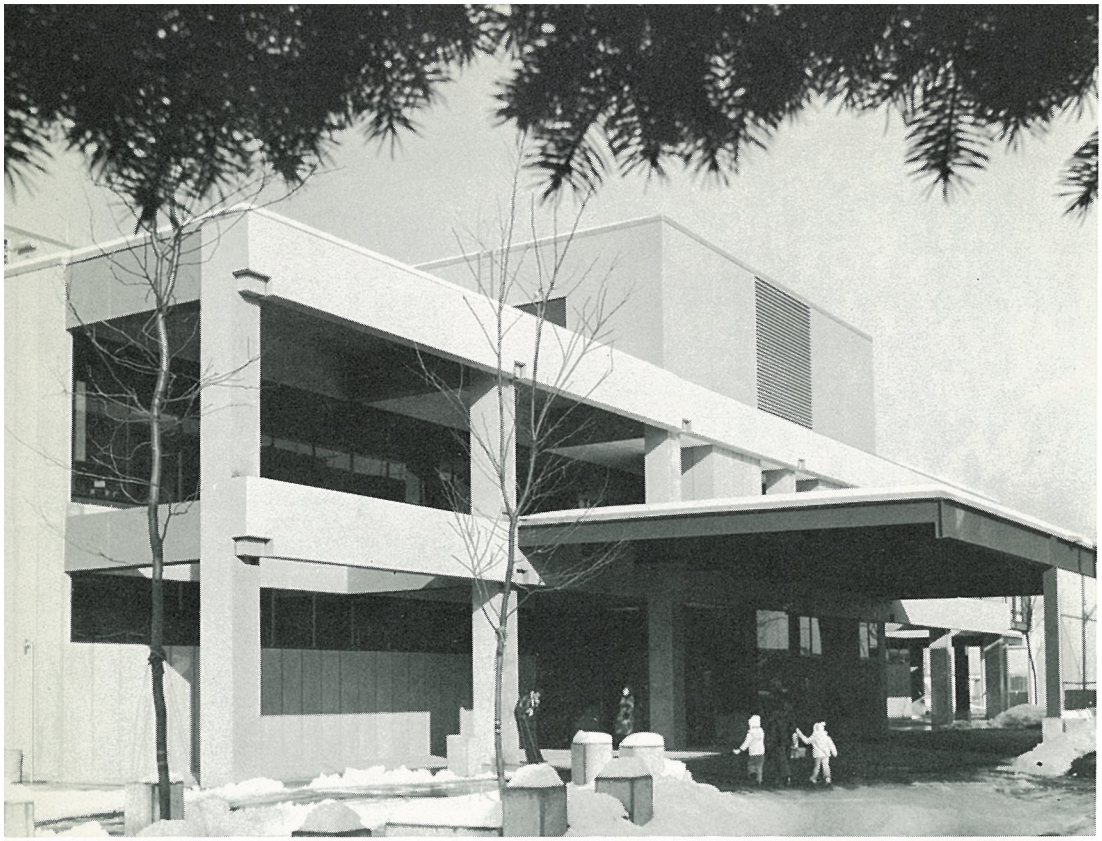
Prestressed Concrete: Arizona Prestressed Concrete Company, Phoenix

Exposed aggregate finish lends warmth and depth to this facade.



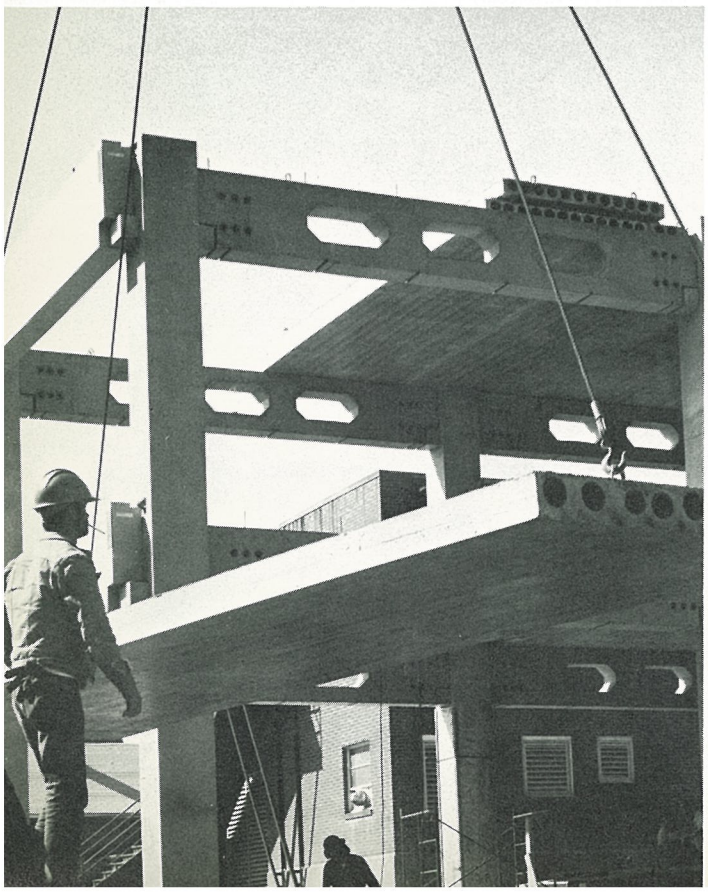
A precast concrete wall panel goes up. Entire structural system is precast.





The strong lines of the exposed structural frame provide the dominant architectural note.

Prestressed concrete eases medical systems integration at health center



The Paul A. Gagnon Community Health Center at St. Joseph's Hospital, Lowell, Massachusetts, is one of the first concrete hospital facilities to integrate complicated mechanical and electrical systems within the structural depth of the floor framing, by means of a 4-ft. "interstitial" ceiling-floor zone. Within this space, systems are easily accessible to workmen for alteration according to changing needs.

Like many such structures today, this health center has a variety of functions. So flexibility was the main design requirement, served admirably by precast prestressed concrete. At present the building provides emergency care, auditorium and classrooms for community health education programs, a medical records department, and central stores.

The three-story building is designed for expansion both vertically, by three more stories, and horizontally, as required in multiples of the bay size. Repetitive use of the three precast concrete elements – columns, beams, and slabs – will simplify expansion and reduce its cost. Floors are designed to carry future loading up to 100 lb./sq. ft.

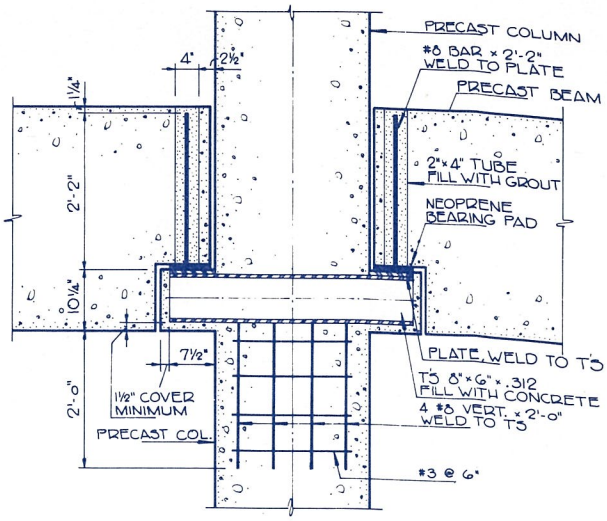
Architect: The Ritchie Organization, Chestnut Hill, Massachusetts

Structural Engineer: Lewis D. Emery, Sandy Lake, Pennsylvania

General Contractor: Gilbane Building Co., Providence, Rhode Island

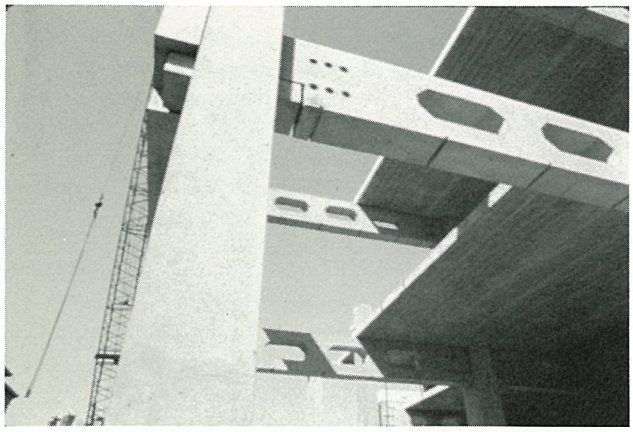
Prestressed Concrete: Unistress Corp., Pittsfield, Massachusetts

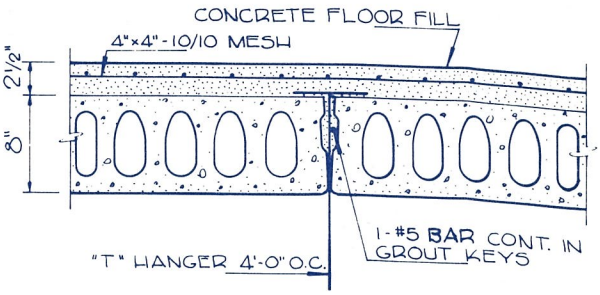
Structural steel tubes encased in concrete form the column haunches for beam bearings. Precast concrete spandrels rest on the haunches at the gable end; they are pocketed to slip over the column haunch, concealing the connection. The spandrels can be removed, replaced with beams, and relocated when the building is expanded.



COLUMN HAUNCH DETAIL

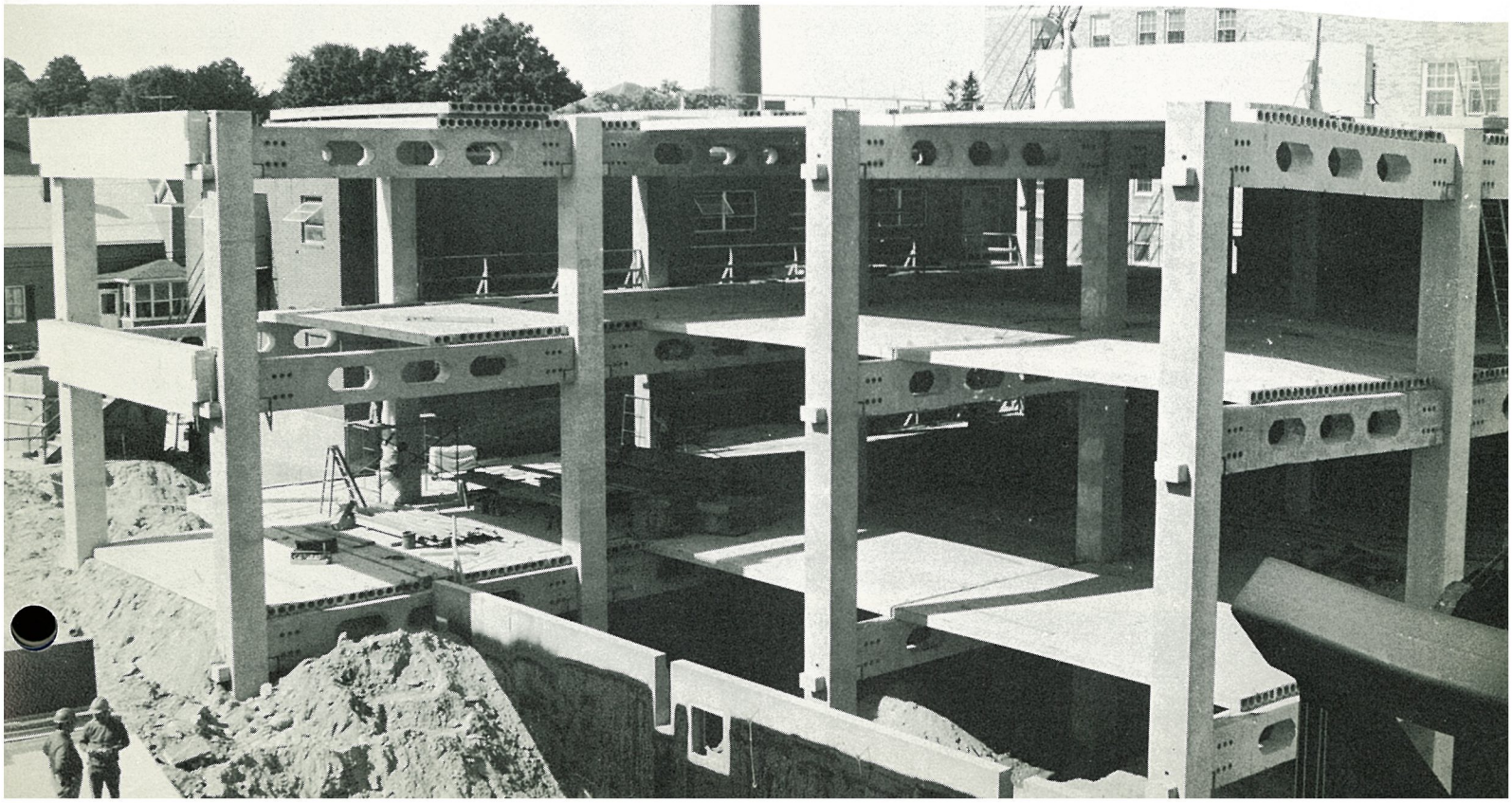
Typical example of beam-to-haunch connection.

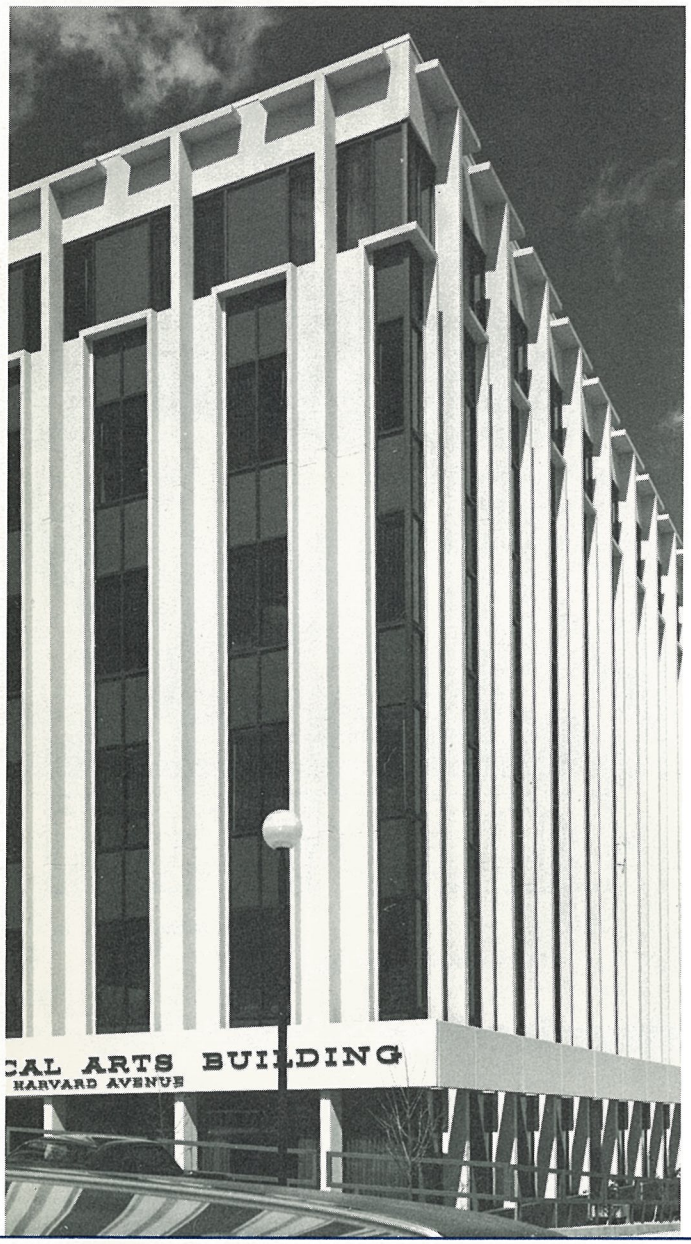




HOLLOW CORE SLAB TYPICAL SECTION

Above the ceilings, precast concrete beams 37½ in. deep are pierced for ductwork, large utility piping, and lines for water and medical gas systems. Resting on the beams are prestressed hollow-core slabs 8 in. deep, topped with 2½ in. of concrete. Trench headers for electrical distribution are contained in both topping and cores. Precast concrete columns support the whole.





COVER STORY

All-precast doctors' office building is energy efficient

The Doctors Medical Arts Building in Tulsa, Oklahoma, has high energy efficiency despite summer heat. Dual-pane windows 3 ft. wide are recessed behind 6 ft.-wide prestressed concrete triple tee wall panels. Mechanical systems, all contained in the precast central core of the building, operate according to zones determined by exposure to the sun. A value engineering study determined that this combination would best fulfill the owner's requirements.

In addition to reducing cooling and heating costs, durable prestressed concrete also minimizes maintenance expense over the years. First cost was reduced by the load-bearing central core and wall tees, which make interior columns unnecessary. Modular placing of panels and the absence of columns enhance flexibility of space planning for individual tenants. The entire building was cast off-site, to avoid crowding the adjacent hospital and nursing home. Rapid construction cut labor and interim financing costs.

Architect/Engineer: Hudgins, Thompson, Ball & Associates, Inc., Tulsa

General Contractor: Seraco Construction Company, Wagoner, Oklahoma

Prestressed Concrete: Thomas Concrete Products Co., Oklahoma City

ARCHITECTURAL STRUCTURAL PCI PRESTRESSED CONCRETE INSTITUTE®
20 NORTH WACKER DRIVE, CHICAGO, ILLINOIS 60606

PCItems Periodical Number 356 / Editor: Dorothy Jerome