Precast Prestressed Concrete Helps Lift High Rise Offices

Designers and owners select precast prestressed concrete as the best solution to the problems of high rise office construction with increasing frequency.

Whether used to cover exterior columns quickly and without maintenance, to form the load bearing walls, or to span interior column free spaces, precast prestressed concrete fills the bill with a multitude of advantages.

A built-in fire resistance rating is not the least of these, especially in such sensitive uses as offices.

A frequently cited advantage is the contribution precast prestressed concrete makes to rapid completion of the building. Money is tied up until occupancy, so any speed up of occupancy not only cuts costs, but also increases the productivity of capital invested.

Several examples in this issue point out ways of achieving column-free interiors in high rise offices—increasing the usable or rentable floor area—a major concern of every building owner. Several of these methods reduce the over-all height of the building by reducing the structural depth of each floor—another direct saving for the owner.

Perhaps one of the most frequently mentioned reasons for selecting precast concrete is esthetics. The versatility of precast concrete enables it to fulfill any design requirements in a pleasing and economical way, often requiring no further finish or treatment.

Robert-Richard Building
Trenton, New Jersey

This office structure rises on precast concrete arches two stories high. The rest of the building is sheathed in U-shaped precast panels and terminates in a deep precast fascia.

Restrictions of the site, busy city streets on three sides, abutting structures on the fourth, eliminated most methods of erection. Only speedy “chop in” erection by crane was feasible.

Precast panels were manufactured during construction of the cast-in-place frame, enabling the contractor to meet a tight schedule between ground breaking and occupancy. Only painting was needed to finish interior walls.

Architect: Kramer, Hirsch & Carchidi A.I.A.
Architects, Trenton

Engineer: Leonard Busch Associates, Trenton

Precaster: Eastern Schokbeton Corp., Bound Brook

THE COVER shows the Mutual Benefit Tower in Philadelphia. Other views and details appear on page six.
American Hospital
Association
Chicago, Illinois

Budgetary and occupancy requirements coupled with site restrictions led to several innovations and construction firsts in the second phase expansion of AHA's headquarters.

The final solution, a column free interior carried on load-bearing precast exterior frames and a cast-in-place central core resulted in 85% usable floor space. The structure is designed for 19 stories, though only 12 were built in this phase. A structurally independent 4 story building links this tower to the phase 1 tower.

The bearing panels are 10 ft. wide and 24 ft. high, except for 44 12 ft. (one story) panels inserted to stagger the horizontal joints.

Erection was done on the land-locked site by the largest tower crane made. It had a 22 ton capacity at 70 ft. reach.

Connections were also unique. Dowels project 3 ft. from the top of each panel into holes cast in the panel above. Each panel is set on a neoprene gasket and the gap and bar holes pressure grouted through plastic tubes cast in the panels. Vent tubes are provided in the upper panel.

Architect: Schmidt, Garden & Erikson, Chicago
Engineer: Kolbjorn Saether & Associates, Chicago
General Contractor: B-W Construction Co., Chicago
Precaster: Hufschmidt Engineering Co., Sussex, Wisconsin
Olympia Square Complex
Don Mills, Ontario

White glazed ceramic tile is used to face the precast concrete column covers and other elements in the first two office towers constructed in this complex. The tile was placed in position in the forms before the concrete was cast, ensuring a monolithic unit and allowing the consistent quality control attainable only with shop fabrication.

Column covers were used as three sides of the forms for the cast-in-place concrete columns and were placed in position as soon as delivered to the site to avoid storage and possible damage.

Precast concrete was selected as the cladding material for these reinforced concrete structures after research because its versatility allowed the strong, bold scale required, and for economy through the repetitious use of modular units, controlled plant manufacture and ease of erection.

Architect: Phase I: Bregman & Hamann; Phase II: Bregman & Hamann and Craig, Zeidler & Strong, Don Mills

Engineer: Farkas, Barron, Jablonsky, Toronto

Precaster: Phase I: Pre-Con Murray, Ltd., Toronto
Phase II: Artex Precast Ltd., Richmond Hill
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1. The first page of the entry will be a "fact sheet" stating the following:

   A. Type of project.
   B. Size in total square footage, or in the case of bridges—the length.
   C. Number and dimensions of precast and prestressed components and prestressed components (and whether the latter are pretensioned or post-tensioned).
   D. Special design features you wish emphasized for the purpose of judging.
   E. Date structure was completed or is scheduled for completion.

2. Concise description outlining the advantages achieved by the precast or prestressed concrete, typed on 8½" x 11" sheets.

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2. Concise description outlining the advantages achieved by the precast or prestressed concrete, typed on 8½" x 11" sheets.
3. A minimum of two 8" x 10" photographs and two 35mm color slides of the completed or substantially completed structure. Detailed photographs, plans, perspective drawings, or large scale details if considered significant by the entrant.

4. Design computations and specifications if they show to a greater extent the design aspects of the entry.

5. Anonymity of entries will be preserved throughout the judging. A sheet giving the proper name of entry, type of structure and location, names and addresses of architect, engineer, and owner, and the date of completion shall be sealed in an envelope affixed to inside back cover of the entry.

All the above to be bound in ring or other type binder, approximately 10" x 12". Entries to be received not later than July 1, 1971, at the Prestressed Concrete Institute, 20 N. Wacker Drive, Chicago, Illinois 60606.

NOTIFICATION OF AWARD: Notification of Awards to entrants will be made as soon as practicable after judging is completed.

OWNERSHIP AND PUBLICATION OF ENTRIES: All entries and all material submitted with entries shall become the sole property of PCI.

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Address all communications concerning this Awards Program to:

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Chicago, Illinois 60606
PRESTRESSED CONCRETE INSTITUTE

A non-profit organization for
the advancement of the
design, manufacture and use of
prestressed concrete and precast concrete
Standard Life Building
Calgary, Alberta

This building has a post-tensioned concrete structural system and precast concrete “rain screen” cladding. The window walls are independent and provide the air, vapor and thermal barrier.

The post-tensioned structural system provided substantial savings. These were effected by reduced quantities of materials and consequent reduced labor costs; the use of large slab panels between beams, reducing forming time and cost; and reduced dead loading, making savings possible in columns and deep foundations.

Erection time was cut by two months because only one floor at a time required reshoring, allowing early introduction of other trades. Time required to place reinforcement was reduced substantially through fewer structural members and using welded wire fabric reinforcement for the slab panels between beams.

Precast concrete spandrel panels and column covers use white cement, silica sand and quartzite aggregate in the concrete.

Architect: Webb Zerafa Menkes Architects, Toronto
Engineer: Farkas, Barron, Jablonsky, Toronto
General Contractor: Ellis Don, Limited, London
Post-tensioner: Conenco, Don Mills
Precaster: Con-Force, Limited, Calgary
Mutual Benefit Tower

The 20 stories of this office structure above an existing parking garage were erected at a rate of a floor a week—without interrupting service in the parking area. Load bearing precast wall panels form the exterior. Prestressed hollow core floor units span from the walls to the core.

Vertical joints between panels have no connections; seams are simply caulked. Vertical dowels are cast in each panel top at the mullions, designed for column action. Holes in the next panel receive these dowels. Plastic rope forms a dam to contain the grout on top of each column and prevent staining of the smooth white concrete exterior finish.

Architect: Eggers & Higgins, New York, and Nowicki & Polillo, Philadelphia
Engineer: Robert Rosenwasser, New York, and David Bloom Inc., Philadelphia
Precaster/Prestresser: The Formigli Corporation, Philadelphia
Both precast and prestressed panels are used to clad this new headquarters office. Precasting was the only effective way to achieve the curving design of the column covers, and prestressing was necessary because of the size of the flat panels used.

The tower building columns are covered with units 5 ft. wide, 2 ft. 6 in. deep and ranging from 4 to 18 ft. high, though most are 14 ft.

The special functions wing is faced with precast prestressed panels to attain the quality and size of panel necessary here. Most of these panels are 42 ft. high. All are 10 ft. wide. All panels are faced with white granite exposed aggregate to match paving and lobby.

Architect: Wilson, Morris, Crain and Anderson, Houston
Precaster/Prestresser: Rackle Co. Div., Trinity Division, General Portland Cement Co., Houston
Piedmont-Cain Building
Atlanta, Georgia

The "pleated" effect of the precast, prestressed spandrel panels in this building offered several advantages structurally and esthetically.

The pleating adds stiffness to these thin slab sections which span 30 ft. between columns, and support the window walls. Each panel was pretensioned during manufacture.

This design also allowed the projection of the glass beyond the face of the columns, adding a considerable amount of additional rental area without increasing the structural bays.

Architect: Toombs, Amisano & Wells, Architects, Atlanta
Engineer: Prybyrowski & Gravino Engineers, Atlanta
Prestressor: Gifford-Hill & Company, Concrete Products Division, Forest Park