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public buildings
Public Owners Solve Problems with Precast Prestressed Concrete

Public building owners—taxing bodies of one size or another—are probably more aware of the economic squeeze on building than any other class of owners.

These governing bodies must go to the taxpayers not only for every cent they spend, but also to the same people as electors to keep their positions.

It is no wonder, therefore, that as building owners they turn more and more frequently to precast prestressed concrete for their building needs.

In addition to the economies of rapid fabrication and placement of building elements—even in weather which might preclude working with other materials—the long term low maintenance and insurance costs of precast prestressed concrete mean a continuing saving: a "life cycle cost saving," as many purchasing agents call it.

But perhaps equally important, public owners do not have to sacrifice quality and aesthetic considerations where they select precast prestressed concrete. Even purely decorative buildings such as the Victoria Carillon are being built of prestressed concrete. And note that this tower is designed to withstand earthquake forces!

The cover shows the new Police Headquarters building in Milwaukee, Wis. More details appear on page 5.

Victoria, B.C., Carillon Tower

The Carillon Tower was designed as an integral part of British Columbia's Archives and Museum complex, built to commemorate Canada's 100th birthday. The architectural theme, symbolizing British Columbia's large evergreens, is carried out in the double tapered columns of the tower.

The tower consists of 12 precast pretensioned concrete columns 90 ft. 9 in. high, supporting the belfry with 491 bells and the clavier room below it. A precast spiral staircase provides access for the operator.

Since British Columbia is in Zone III, the tower was designed for severe earthquake loading. Frame action was secured by cast-in-place horizontal ring beams.

Precast concrete was used for the columns as the only material offering all the desired advantages of one piece fabrication, erection in a finished condition and freedom from maintenance problems.

Architect/Engineer: British Columbia Department of Public Works, Victoria

Precaster/Prestresser: Bordignon Masonry Ltd., Vancouver
Washington State Highway Offices, Olympia

This building has over 300,000 sq.ft. of floor space, and is the first step in a long range plan which will provide over 1,000,000 sq.ft. of office space for the State government in Olympia.

Design was complicated by the desire for a modular, modern design which would harmonize with the 19th century classical state Capitol complex. Relationships of scale, texture and color in precast prestressed concrete made this possible without compromising contemporary design standards.

The structural system uses 3-story load bearing precast wall panels supporting pre-stressed channel slabs that clear span the floors and roof. Each floor consists of four internally flexible blocks of office space each 55 x 140 ft. using a 5 ft. planning module.

Precast and prestressed concrete were chosen for speed of fabrication and erection. The 9,000 tons of precast concrete were produced in five months using daily production cycles. Use of precasting also permitted the close forming tolerances and color control required. The concrete mix used a special buff colored cement. Very few special forms or form changes were required.

Architect: The Richardson Associates, Seattle

Structural Engineer: Victor O. Gray & Company, Inc., Seattle

Precaster/Prestresser: Concrete Technology Corp., Tacoma
United States Mint

The new United States Mint will produce 4 billion coins annually with 525 employees working two shifts. The old mint produced only 3 billion coins working 3 shifts. This new building is only two blocks from the site of the original mint, the first public building built by the US, in 1792.

To accommodate the large spans necessary in the two production areas—one 120 ft. clear span, the other 150 ft. in 2 spans—the building is roofed with 7 ft. prestressed concrete single tees. The longer tees, 75, 90 and 120 ft., posed special problems in placement since the streets adjacent to Independence Hall Mall which the Mint overlooks, are old and narrow.

The machine room carries very heavy loading. In this area, the floor is supported by prestressed AASHO Type IV girders spanning 74 ft.

There are 520,000 sq.ft. in the building. Lobby and production areas are 3 stories high. A visitors gallery accommodating 2500 visitors an hour overlooks the production areas on each side from the 3rd floor level.

*Architect/Engineer: Parsons-Jorden Corporation, New York*
*Consulting Architect: Vincent C. Kling, FAIA, Philadelphia*
*General Contractor: McCloskey & Co., Inc., Philadelphia*
*Prestresser: Eastern Prestressed Concrete Corporation, Hatfield*
Police Headquarters
Milwaukee, Wis.

The newest building on Milwaukee's Civic Plaza uses precast concrete in two contrasting finishes to achieve a pleasing and dramatic facade.

All columns are faced with smooth finished white concrete flat panels matching the horizontal bands at the top. The window-wall units with their integral sun screen fins are exposed gravel aggregate in a gray concrete matrix.

Altogether, about 1000 precast panels were used. Of these, 330 are the complex window wall units with their fins. At the bottom, these fins are over six feet in depth, tapering inward as their position on the building rises.

There are three panels across each bay of the Police Headquarters and each is one story high. The largest size of these panels weighs 24,000 lbs.

Each wall panel had a haunch cast in the rear face by which the panel was hung from the frame. Connections at the haunch were welded while lower edges of each panel were bolted. Column cover connections were similar except that dowels were used to fasten the lower edges of these members.

Consulting Engineer: Amman and Whitney, Milwaukee
General Contractor: Kroening Engineering Corporation, Milwaukee
Precaster: Hufschmidt Engineering Company, Sussex
Heard Natural Science Museum 
McKinney, Texas

The need for unencumbered interior space and necessity of building a fire resistant structure led to the choice of precast prestressed single tees for the roof members of this museum. The museum overlooks a large tract of rustic land laced with nature trails and its remote location makes fire fighting access minimal.

Eight pretensioned single tees 67 ft. long, set on 12 ft. centers, span the building. The 4 ft. space between tees is spanned with bulb tees supporting fiber deck panels and a two inch topping of lightweight insulating concrete.

Since display requirements and possibly office space requirements would be changing constantly, it was desired to have the building interior column free. This was the prime reason for selecting the long span prestressed members.

Access to the park and its nature trails is direct from the lower level of the museum which is set into a hillside giving ground level access to the upper level of the museum from the opposite entrance.

Architect: I. Herschel Fisher FAIA and Pat Y. Spillman, FAIA, Dallas
Engineer: Chester R. Reed, Dallas
Prestresser: Texas Industries, Inc., Arlington

Fire Training Tower
Lexington, Kentucky

Among the more unusual buildings featured in pcreats is this Training Tower for the Lexington Fire Department. The building is used only to train firemen in ladder work, hose handling and other facets of their duties.

Structurally, the building is all precast prestressed concrete. Columns and beams are precast while floors and roof are prestressed 8 ft. double tees. Each column has cast-in haunches for the beams, on which the tees rest. Infill walls were placed on only two sides of the structure, leaving the two end walls open.

The building is 32 x 24 feet and has five floors, including one on grade. During training, fire conditions can be simulated with the use of various smoke generators. Training involves not only the aerial truck ladder shown, but also the use of various hand ladders and single story scaling ladders.

Architect: Paul Kissell, Lexington
Engineer: Harry Scoggin, Hinsdale, Ill.
Precaster/Prestresser: Kentucky Prestressed Concrete, Inc., Lexington
Both cast-in-place and precast post-tensioned concrete are used in the terminal building of Houston's Intercontinental Airport.

Cast-in-place post-tensioned waffle slabs form the structural system for the principal lobby areas. Each waffle is 20' 10" sq. and 5 ft. deep. It was the largest waffle slab built at the time of completion with an area of 280,000 sq. ft. per floor.

Prestressed double-tees, placed on post-tensioned beams, were used for the roof top parking level. Parking floors also have 280,000 sq. ft.

The post-tensioned waffle slab system was chosen for its long span capability—column spacing is 41' 8" o.c.—and to accommodate the double cantilever required by the design of the building's corners. These corners had to be column free because exhaustive research showed such spaces would be needed for unobstructed circulation. The slab system also serves as the lobby ceilings. Each waffle holds a light fixture and gives this large space a sense of human scale.

The double-tees were chosen for economy in the long spans required by the layout and vehicular circulation. These economies were most important in enabling the architect to keep within the $25.00/sq. ft. budget limit.

*Architect: Coleman & Rolfe and Pierce & Pierce, Houston*

*Engineers: Lockwood, Andrews & Newnam, Inc., Bovay Engineers, Inc. and Turner, Collie & Braden, Inc., Houston*

*Post-tensioning: Prescon Corporation, Corpus Christi*

* Prestresser: Texas Industries, Inc., Houston*
Lefleche, P.Q.,
Postal Station

Only eleven double tees are used to roof this post office and letter carrier station. The building provides nearly 8,000 sq. ft. of column free space.

The 10 ft. wide tees are 3 ft. high with close-spaced stems. Each tee is 81 ft. long and is supported by the masonry bearing walls. Nine architectural precast columns and pilasters are also used around the entrance porch.

In this application, precast prestressed concrete offered economy and erection time comparable to other structural systems without the need for extra fire protection or added ceilings.

Heating and air conditioning ducts were integrated in the spaces between stems of the tees with lighting incorporated in the spaces between adjoining tees.

Architect/Engineer: Department of Public Works, Quebec Region Design Office, Montreal

General Contractor: C. Major Construction Ltée.,
Ste-Thérèse de Blainville

Prestresser: Francon, Ltée., Montreal