



A Chapter of the
Precast/Prestressed Concrete Institute

NEW YORK BOTANICAL GARDEN PARKING GARAGE

Bronx, New York

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PROJECT FACTS

- PRETOPPED 7,000-PSI DOUBLE TEES MIXED WITH CORROSION INHIBITOR

- VERTICAL ARCHITECTURAL CLADDING

- 8-STORY

- 825 VEHICLE SPACES

1,159 PRECAST ELEMENTS INCLUDE:

- DOUBLE TEES, SLABS, BEAMS, COLUMNS, TREE COLUMNS, SPANDRELS, LITE WALLS, SHEAR WALLS, STAIR WALLS, STAIR UNITS AND WISHBONE WALLS



PRECAST CONCRETE & PARKING



Photos courtesy of Unistress Corporation, Pittsfield, MA.



The design for the new parking garage and inter-modal facility at the New York Botanical Garden in the Bronx preserves the valuable landscape of the garden by locating the building just outside the Garden's walls, extending the garden into the community. Ennead Architects designed the structure using precast concrete with a metal trellis infill to reinforce that extension and visually link the design of the new facility to buildings within the Garden proper.

The eight-story, 300,000-square-foot structure, which accommodates 825 vehicles, was designed to be LEED Silver equivalent. The precast concrete system features 1,159 distinct pieces: double tees, slabs, beams, columns, tree columns, spandrels, lite walls, shear walls, stair walls, stair units, wishbone walls and vertical architectural cladding. Unistress Corp. fabricated the components. Early in the design process, the design team concluded that the owner's needs would be best achieved by the selection of an essentially all-precast, prestressed concrete system, according to Susan Rodriguez, design partner for Ennead Architects. Benefits included durability, which would be achieved through the use of pretopped 7,000-psi double tees mixed with corrosion inhibitor, and speed of construction, which was critical for the busy urban setting with railroad lines 20 feet from the site.

Precast concrete also presented the shortest construction duration, provided flexibility in the construction schedule and minimized the impact of weather, the design team concluded. The large number of highly respected PCI Certified plants in the area created a competitive bidding climate that provided the owner with a high-quality, single-source provider.

The Garden's previous experience with precast concrete and the ability of the designers to tour precast

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facilities in the area ensured the client that the material could provide both quality and consistency for a successful outcome given the unique parameters of the design.

The dominant feature of the facility is its distinctive exterior façade, which creates a “vertical garden” on all four sides of the building. A series of monumental forked elements, symbolic of a simple branch structure, envelop the entire building to form an overall enclosure and vertical trellised landscape. “The design adds texture and greenery to the dense urban environment,” says Rodriguez. Interstices between the forked elements are covered with a greenscreen brand wire trellis, planted with a variety of flowering vines. Because of the tight site and railway restrictions, cranes were unable to swing over the railroad tracks, resulting in four cranes being used to erect the panels. A number of pieces had to be blindly hung with the use of radio contact among the construction crew. Large pre-existing specimen trees on the site had to be preserved during the construction process as well.

The design for the trellis enclosure required fabricating monumental chamfered precast elements to create an outer layer that attaches to the more standardized structural components on the interior, explains Rodriguez. “The use of precast concrete allowed these very specialized, large-scale elements to be fabricated economically, due to the repetitive nature of the design.”

A unique shear-wall design was used to create visibility around corners. Openings in the shear walls improved sight lines for visitors driving up the ramps while maintaining seismic structural requirements. A gap in the structure on the interior resolved the site’s irregular geometry and formed a light well that brings daylight into the interior of the garage at all levels.

Standard precast pieces, modified at the end conditions in response to the unique geometries, created an efficient accommodation of the irregular shape of the site and maximized the number of cars within the structure.

Precast provided the opportunity to use very unique shapes and finishes that distinguish this project from other parking facilities through the creation of a monumental trellis. This element transformed the facility from merely an 825-car parking garage into a vertical garden and symbol of the Institution.