

ideas

by design

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PARKING STRUCTURES THRIVE USING PRECAST COMPONENTS



*Mystic Transportation Center
Medford, Mass.*

Owners, developers, architects and contractors all benefit from using precast, prestressed concrete components to design and build parking structures. Throughout the country, thousands of precast structures are parking millions of cars, with some of the largest structures ever built being created from precast designs. The reasons for this popularity are many:

- **Environmental Friendliness:** As communities demand more open green space around developments and concerns rise over water conservation, the need grows for more tiered parking. Precast components create this format in a cost-efficient way that fits perfectly with construction timetables and budgets.
- **Safety & Security:** The use of new framing techniques, including light walls and K-frames, help designers create light, bright interiors that completely eliminate shadowy spaces, thus increasing intrinsic security for users.
- **Aesthetic Variation:** Precast concrete can mimic a variety of costly facing materials, including limestone, sandstone, brick and terra cotta. This allows the structure to blend with its neighborhood. The addition of decorative details can add visual interest and reduce the structure's visual mass, creating a community-friendly facility.
- **Fast, All-Weather Construction:** Precast's ability to begin casting while foundation and site work begin speeds up construction and reduces on-site labor logistics. This factory production also ensures manufacturing and erection remain unaffected by harsh weather, eliminating much of the cushion required in schedules for potential delays.
- **Design Flexibility:** Long, clear spans and compression strengths far above typical ranges create life cycles as much as double typical expectations. New precast technologies that allow structures to meet any seismic code have expanded designers' options further. These precast benefits accrue to parking structures of all sizes and locations, from 200 to 12,000 spaces or more.
- **Quality:** Fabrication of precast components is stringently audited by PCI. This ensures that each PCI-certified plant adheres to comprehensive quality control procedures. An added benefit is the inherent increased durability that minimizes the need for continuous inspections and costly long-term maintenance.



INTEGRATED DESIGN AIDS TEAM FROM START

Designing and constructing the best parking structure for the site, its patrons and the budget requires a careful balance of elements and a logical plan from initial commitment through occupancy. Assembling a team that includes all of the major project contributors, including the precaster, ensures that each element of the design is considered.

Partnership approaches can be achieved using a preconstruction services agreement, consultation contract or traditional design-bid-build formats. The commitment to an early partnership maximizes communication and improves the bottom-line benefits.

• DESIGN CONSIDERATIONS

The precaster can help finalize performance characteristics, durability capabilities, life-cycle needs and cost potentials. Input on traffic flow, drainage, and other functional parameters can be coordinated early on in the design process.

• BUDGET CONSIDERATIONS

Precasters can aid the project's development by establishing material budgets that represent a significant portion of the structure's hard costs. They also can advise on the optimum design that maximizes the efficiency of the structure and minimizes the costs to the owner.

Guaranteed Maximum Pricing can guarantee over 50% of a parking facility's costs early in the design process, thus allowing for major construction to start early.

• STRUCTURAL INTEGRITY

Precasters can provide input during design as to the most economical framing layout. These are critical design factors in the cost and how the design will produce a secure, efficient, and easy-to-use facility.

The precast industry has developed new, less expensive ways to meet more stringent seismic design requirements. Our Precast Seismic Structural Systems (PRESSSS) research program along with innovations in the connection of precast components, both to each other and to the foundation systems, have resulted in a totally new approach to seismic restraint. Applying PRESSSS research can provide economical and safe structures anywhere in the world.

• DURABILITY

High performance and durability against corrosion are inherent benefits to precast parking facilities, and they can truly enhance a facility's service life. Precast manufacturers routinely use low water/cement ratios in their casting

processes, which can result in final design strengths of 7,000 psi to 9,000 psi at no premium to the owner.

Precast concrete structures deliver built-in performance resulting in both short- and long-term reduced construction and maintenance costs. Any project would be enhanced by the precaster's input early in the design stage. Higher levels of durability and strength are readily available by using high performance concrete (HPC), which allow for even more economies in design and longer-life structures requiring less maintenance.

• AESTHETIC APPEAL

Precast concrete facilities open the door to a wide array of attractive and aesthetically diverse designs and façade treatments.

A parking structure's appeal extends beyond just exterior considerations but to the interior, where traffic flow and proper lighting levels assure that users have a safe, bright structure.

• SUPERIOR MAINTENANCE

The benefits of a precast structure don't end once the facility is constructed. Maintenance programs represent a major part of any long-term budget, and these costs should be considered at the design

phase. The precaster can help create a maintenance timetable that ensures the structure remains in top condition, maximizing its service life and minimizing operational costs.

Such a program includes a monitoring schedule that allows the owner's representative to inspect the structure quickly and thoroughly. This is made easier with precast concrete components, as the regular joint spacing reduces the random cracking that is common with other types of concrete. Since joints are the most typical sources of maintenance problems such as spalling from freezing and thawing, inspectors can quickly and precisely locate the most likely trouble spots. The precaster also can provide details on when to inspect joint sealants and how often to update caulks or toppings.

- **SINGLE-SOURCE PROVIDER**

Precast concrete components provide one reliable and certified source for supplying the entire structure and façade. This approach ensures turn-key responsibility and accuracy for meeting design specifications rests with only one supplier. Consistency, tolerances, deadlines, and warranties are assured.

- **HIGHLY TRAINED AND AVAILABLE WORK FORCE**

With the construction industry facing



*SunTrust Plaza
Winter Park, Fla.*

the growing challenge of filling new job openings and having labor available as projects are scheduled, owners and designers can be assured that precast concrete components will be produced by a highly trained workforce that is consistently available and highly skilled at its duties. This experienced work force coupled with PCI certification ensures high quality.

On the following pages are a variety of precast structures that show the diversity and inherent benefits of our offerings. The economy and benefits of precast concrete structures are built-in regardless of size, and savings per car are realized with structures with as few as 200 spaces. Precast provides the inherent design and build flexibility needed to ensure economies of scale and functionality, no matter how large the project.



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