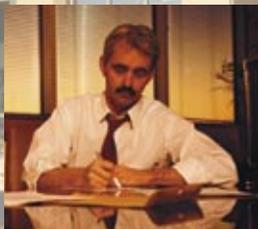


TOTAL PRECAST CONCRETE STRUCTURES

Combining architectural and structural functions creates advantages that include speed, flexibility and aesthetics.



The Total Solution for the



OWNER

Total precast concrete building systems, in which architectural and structural precast, prestressed concrete components combine to create the entire building, are becoming the format of choice for many construction teams.

This design approach can take several forms, including precast columns and beams with panelized cladding or load-bearing precast walls and double-tee or hollowcore flooring. In any format, the advantages benefit every member of the construction team — especially the owner, whose goals are always paramount.



Speed to market

Developers who use total precast systems say it saves the project six to eight weeks compared to steel and even more when compared with cast-in-place concrete. That savings can be critical in bringing a new building into a competitive market or in meeting a tenant's need for occupancy on a specific date. As permitting and decision-making processes slow, total precast system's speed helps keep projects on track.

The scheduling advantages result from several factors that grow through the process:

- **One-stop shopping** secures much of the building's shell in one efficient, contractual relationship.
- The ability to **begin fabrication while permitting and site work are completed** allows precast concrete to begin erection as soon as foundations are complete.
- Designers find precast systems **easier to design**, thanks to aid from the precaster's engineering.
- Precast components can be **erected in winter conditions**, maintaining tight schedules.
- With total precast systems, speedy erection allows the contractor to **enclose the building quickly**, giving interior trades faster access.
- **Precast's inherent fire resistance** eliminates the messy and time-consuming work of fireproofing a steel structure and then repairing it as other trades finish.

Strong image

Precast concrete panels offer a wide range of styles and can be produced in a variety of colors, textures and finishes. They can replicate granite, brick or stone, achieving a strong, institutional image at a fraction of the cost.

High quality

PCI-certified precast concrete fabricators must undergo two annual, unannounced inspections that review more than 120 production and quality-assurance processes. The tight control ensures components are produced with uniform consistency.

Low maintenance

Precast panels require less maintenance than other materials. Incorporating the architecture into the structure enlarges panel sizes, minimizing the number of joints. This significantly reduces the chance for water penetration that can weaken a structure and cause unsightly staining and mold problems.

Effective pricing

Because of precast concrete's tightly controlled and shorter production process, costs can be more accurately estimated earlier in the process. Parallel effort by precast engineering ensures that estimates remain stable, assuring the contractor, owner and design team that the budget is sound.

Safety

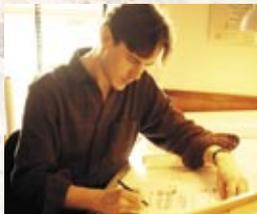
In-plant casting keeps the site cleaner and eliminates trades from the construction zone, improving logistics and enhancing worker safety. The ability to provide a clean site is particularly vital on existing campuses and in dense urban areas, where adjacent businesses can maintain near-normal activities.

Early input

Precast manufacturers support design and coordination efforts as early as half-way into schematics. The precaster can ensure the building takes full advantage of state-of-the-art fabrication and connection techniques. This input allows the project to remain cost-effective and efficiently designed.



The Total Solution for the



ARCHITECT

In addition to helping to meet all of the building owner's goals, total precast concrete systems provide specific advantages to architects that make the design process smoother.

Interior design flexibility

Precast concrete systems help building owners adapt to changing client needs through the years. Double-tee spans of 45 to 50 feet match typical composite-steel framing and minimize the need for interior columns required with cast-in-place systems. Precast spans can reach as much as 70 feet, providing flexibility for challenging interior requirements. Precast also provides high floor-loading capability with little added cost.

Efficient design

Working in parallel with the precaster can provide early and precise design aid that ensures the most efficient sizes and shapes for components, which minimizes the budget for casting, transporting and erecting pieces. Component repetition reduces form costs and aids design speed while retaining design flexibility. These cost efficiencies free up more of the budget for other critical design areas.

Aesthetic variety

Innovative precasters continue to develop mixes, tints, insets, finishes and multi-color pours, providing an almost endless range of aesthetic options. Virtually any desired appearance can be achieved. The options include natural stone replication, inset brick, multi-color panels, multi-surface textures and special logo, emblem or signage embeddings.

Strong finish-approval process

Precasters can provide finish samples, range samples and large-scale mockups, ensuring that design concepts translate into reality. Designers can inspect window interfaces, joint connections and other critical elements to ensure they are visually acceptable and will properly interface between trades. Plant visits to discuss technical and aesthetic concerns provide control without requiring constant site supervision.

Green design

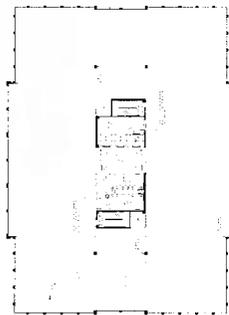
Precast concrete offers a number of benefits that make it environmentally friendly, a growing need as the Leadership in Energy & Environmental Design (LEED) criteria become more popular. Precast requires fewer chemicals to keep it clean over its long lifetime, and it offers a high thermal mass. It can be produced locally and creates no job waste. Cement reducers such as fly ash and other admixtures also aid its environmental friendliness. And its high durability gives it a total service life that far outpaces designs using other building materials.

Tight floor-to-floor heights

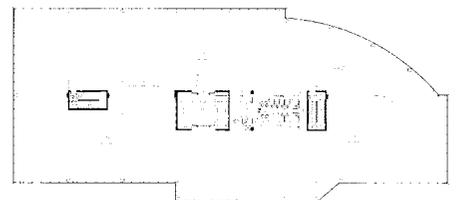
Precast concrete systems sometimes fit within alternative system depths but shouldn't add more than approximately eight inches to each floor level, creating an approximate 5-percent increase in exterior wall material. This slight addition is easily overcome by working with the precaster to make effective use of the overall floor-plan shape and using the benefits precast provides in repetition of component fabrication.



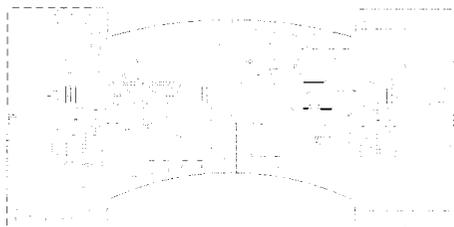
Crescent VII



Crescent IV



Maroon



Aurora



TCI

Precast concrete components allow architects to create any floor-plan configuration desired.

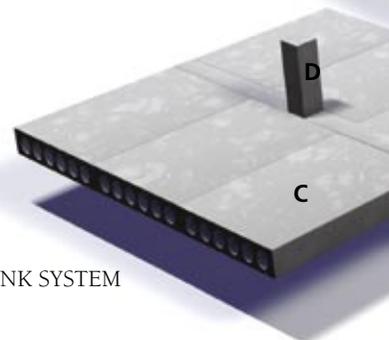


The Total Solution for the General



CONTRACTOR

General contractors find precast concrete components make their job easier at the site, ensuring a smooth process for the owner and designer in both the short and long terms.



HOLLOWCORE PLANK SYSTEM

Construction speed

Time is money for the entire construction team. Precast concrete's speed through design, fabrication and erection help meet tight deadlines. This particularly aids contractors when permitting processes slow down or unforeseen delays arise at the site due to soil conditions or other factors. Precast structural systems are ready to be erected when the contractor is prepared.

All-weather construction

Contractors can minimize the added "cushion" created in schedules to accommodate bad weather conditions, since precast components can be produced and erected all year round. The roughened surface of precast components does not become slick or difficult to handle in harsh weather as other building materials can.

Foundation aid

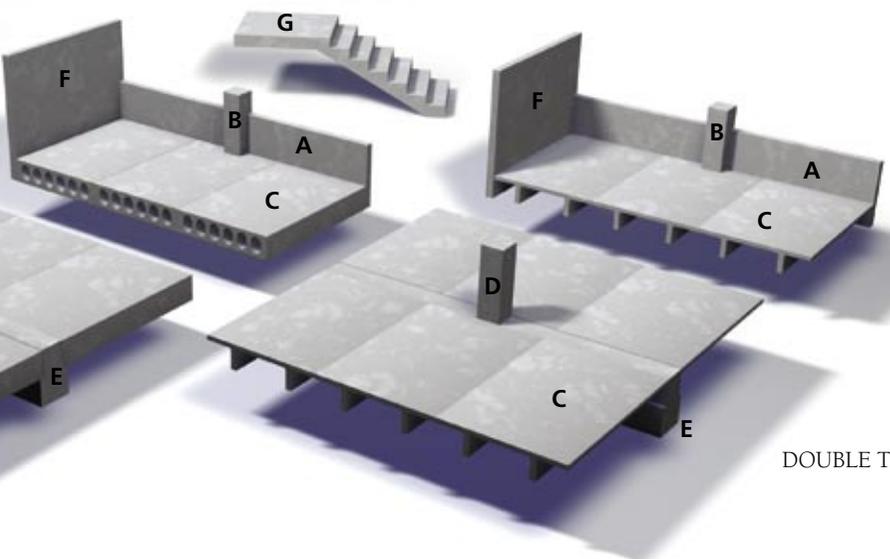
Total precast systems can minimize foundation work by having sills designed as grade beams and basement walls and core walls designed as precast panels. The components can be fabricated in advance and laid into place as soon as the site is ready.

Fireproofing

This messy, time-consuming job can be eliminated, along with the need to patch and rework after other trades finish at the project's later stages. Precast members are naturally fire protected, because they will not burn.

Smooth erection

Because precast concrete pieces are fabricated in controlled conditions using high-quality procedures, designs more exactly meet specifications. Field adjustments thereby are reduced, creating a smooth erection process with minimal surprises.



- A.** Load-bearing architectural spandrel
- B.** Exterior column
- C.** Double tee or Hollowcore plank
- D.** Interior column
- E.** Inverted tee beam or Composite Beam
- F.** Shear wall
- G.** Stairs

DOUBLE TEE SYSTEM



The Total Solution for the Structural



ENGINEER

Structural engineers report no difficulty in learning to design with total precast concrete systems. They also benefit from the material's ease of use and efficiency.



Lateral design flexibility

Combining architecture and structure provides efficiencies in many buildings' lateral support systems. External elements, typically cladding-on-steel or concrete-framing systems, can become laterally stiff and resist wind and earthquake forces. Parallel efforts by the precast engineer can provide the structural engineer with specific input ahead of final construction document preparation, limiting shop-drawing review effort and redesign.

All-in-one components

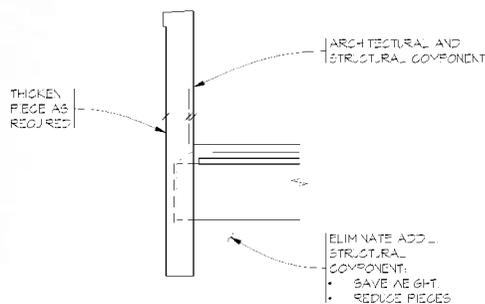
Total precast concrete systems allow the architectural panels to serve structural functions, limiting the need to incorporate multiple materials and trades. For instance, spandrel panels support floor systems and windows while providing final exterior finishes. Or sill panels are used as grade beams, retain soil, support windows and provide the architectural exterior finish, avoiding complex cladding systems. Combining exterior spandrels into the structural system provides deeper elements, limiting deflections and the complexities of designing for relative movements between frame and cladding system. Precast cores support floor systems while providing secure and fire rated enclosures for elevators and stair functions.

Comprehensive drawing

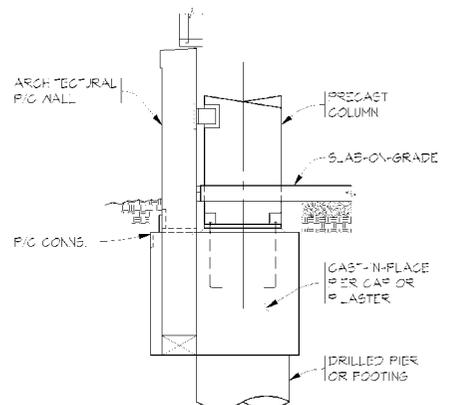
A total precast concrete system ensures one-stop shopping for the core/shell design. One source can design and supply the entire system, generating a better coordinated set of drawings that allows construction to proceed more efficiently. It eliminates the added effort needed to coordinate various trades when using mixed systems controlled by different suppliers.

Easy handling

Site construction moves smoothly because no special equipment or techniques are required to transport or lift combined structural and architectural components. These types of activities often can require additional structural review and exposure.



Total precast concrete systems can provide dual-use components by combining architectural and structural needs into one piece.



Cost and time can be saved by combining a precast concrete panel with foundation components, taking full advantage of the material's adaptability.



TOTAL PRECAST

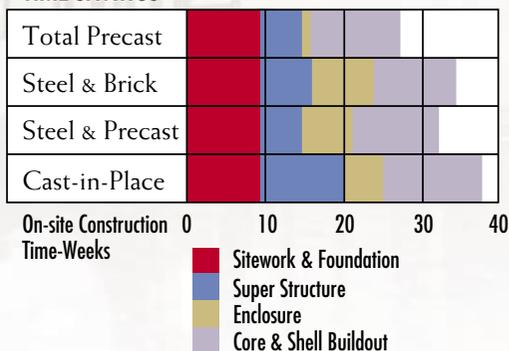
TOTAL PRECAST CONCRETE SYSTEMS vs. OTHERS

BENEFITS	PRECAST	CAST-IN-PLACE	STEEL
Everyday Design Flexibility	✓	✓	✓
High Performance/Low Maintenance	✓	✓	✓
Fast Construction—Year Round	✓		
Factory Controlled Quality—Certified Plants	✓		
Low Cost/Labor Savings	✓		

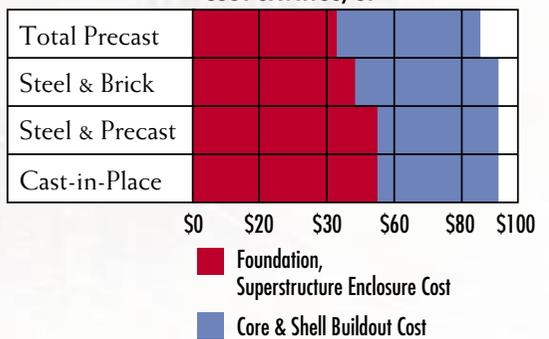
COSTS			
General Conditions	Lowest	Highest	Higher
Structure & Enclosure	Lowest	Highest	Higher
Concrete Decks & Topping	Higher	Lowest	N/A
Shear Walls	Higher	Highest	Lowest
Fireproofing	Lowest*	Lowest*	Highest
Caulking	Lowest*	Lowest*	Highest
TOTAL	Lowest	Highest	Higher

*Costs for fireproofing and caulking are the same for a total precast system and cast-in-place concrete.

TIME SAVINGS



COST SAVINGS/SF*



*Savings shown are based on comparisons – conducted by nationally-recognized estimating firm – of two prototypical office buildings: 1) a 4-story, 100,000 sf building; and 2) a 8-story, 200,000 sf building, both constructed with a total precast building system, and each with a footprint of 113' x 227'. These buildings were compared to similar prototypes constructed with steel or cast-in-place frames and brick-veneered or precast enclosures.

CONCRETE SYSTEMS mean SUCCESS

The benefits offered by total precast concrete systems accrue to the owner, architect, general contractor and structural engineer's bottom lines — and ultimately benefit the end user. The system provides an efficient design, cost effectiveness and a strong, durable appearance that will maintain its image throughout a long service life.



KEY BENEFITS

- Speed to market
- Design flexibility
- Aesthetic versatility
- High quality
- Low maintenance
- Environmentally friendly
- Strong engineering support
- Single-source supplier



To learn more about total precast concrete systems and the benefits that can be achieved, visit the Web site for the Precast/Prestressed Concrete Institute at www.pci.org or talk with your local precaster.



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*Visit PCI on the Web at www.pci.org to gain
additional information and case histories
about precast concrete's total precast systems.*