

# Prefabrication Provides Built-In Benefits.

— Randy Simmons



**P**refabricated systems offer many well-recognized benefits including improved speed and quality control. With the growing focus on high performance structures, other less well-known attributes, including human resource management and sustainability, may soon be equally as important. As a time-tested prefabricated system, precast concrete inherently provides versatility, efficiency, and resiliency resulting in improved quality, performance, and sustainability.

## Increased Speed

Precast concrete accelerates construction in many ways. First, it is



*The Publix GreenWise in Tampa, Florida used architectural and structural precast in order to build the upscale, grocery store on a tight construction sight, as well as completed the project in about 2/3 the time as conventional construction. Top photo courtesy of Nino Giannotti. Bottom photo courtesy of Ariel Innovations, Inc.*



— Randy Simmons is CEO of R.R. Simmons Construction. He has more than 35 years of experience in construction, construction management, and design build.

manufactured off site, which allows other work to begin sooner. Excavation, footings, and foundations can often be constructed while precast

is being manufactured. With site-built systems, such as cast-in-place concrete, the prerequisite work must be in place before construction can

begin. For example, forming cannot commence until the foundations are cast, cured, and available.

The fast erection process for precast also provides schedule benefits. Precast is typically installed with a crane and a relatively small crew. With a single thin-brick embedded wall panel, 400 sq.ft. of brick wall can be installed in about 15 minutes. Compare this to the time it would take masons to hand lay a similar wall section. Moreover, increased wall heights do not affect erection time for precast panels. However, with hand installation of brick, increased wall heights require additional scaffolding, structural support or anchorage, expansion and control joints, and other preparation that may affect the schedule.

In addition, precast concrete can be erected in almost any weather, so weather delays are essentially non-existent. Since precast concrete arrives to the project ready for installation, it does not require protection from weather such as rain, snow, or wind. Most site-built systems, such as cast-in-place and masonry systems, require additional resources and time to protect them during construction and are often delayed by cold temperatures.

### **Increased Quality**

Prefabrication typically elevates the quality control process. To ensure high quality, concrete must be mixed, placed, consolidated, and cured correctly and under a specified set of conditions. Precast production plants tightly manage the manufacturing process with buildings, protective systems, and monitoring to control the production environment. Duplicating these controlled conditions on a project site is more difficult, more expensive, and sometimes even impossible.

PCI-Certified Plants have extensive quality assurance programs and quality control procedures in place. Certified and dedicated quality personnel assure that products meet or exceed project specifications. Precast producers also employ a trained and consistent labor force. With other systems, field labor forces can be different from project-to-project, or even day-to-day. In addition, precast plants undergo

unannounced inspections each year performed by independent engineers. Factory inspection and quality control standards reduce flawed materials from being delivered to a project site and installed only to be removed later in a costly and time-wasting delay. This enhanced oversight of the entire process results in a high quality product, which inherently provides several superior performance attributes, including high strength, low permeability, and long-term durability.

### **Human Resources**

Precast concrete can be manufactured and erected in a fraction of the time and with a fraction of the manpower required of cast-in-place concrete. For example, a mid-rise residential tower composed of cast-in-place flooring and structural systems requires an astounding amount of sheer manpower to construct. In addition, a small army of craftspeople on scaffolding is necessary for the vertical installation of the accompanying metal stud and stucco veneer system, with inherent safety risks. It is a slow process fraught with opportunity for system failure. Utilizing a precast solution minimizes the human resources required for successful project delivery by smartly shifting the construction process away from the “bigger hammer” theory of more labor, to a delivery system that is more reliant on highly skilled professionals and lean delivery.

### **Sustainability**

Sustainability requires the consideration of how construction will affect the project site and the surrounding environment both during and after construction. In sharp contrast to systems which require significant staging and lay-down space, precast concrete minimizes negative effects to a project site. Utilizing a “build within a bubble” approach, precast construction requires only a small site footprint. With “just in time” delivery, precast construction nearly eliminates lay-down and staging areas, as many concrete components can be erected and staged off the bed of the delivery truck.

For proof, take a look at the award-

winning, large-scale gourmet grocery store on the ground floor of a parking structure recently designed and built by R.R. Simmons. With the limited availability of land in this specific hip, urban market, the team harnessed a precast concrete structural and architectural solution to deliver the unique project without the use of ground floor parking space. Erecting the project from the inside out, the team virtually eliminated interruptions to the daily lives of those in the neighborhood while delivering a building that is highly practical, functional, and attractive.

Other important aspects of sustainability include waste reduction and local sourcing. Many precasters recycle waste materials such as water, aggregate, and steel at their plants. PCI recently launched a Sustainable Plant Program with the goal of reducing precast plant waste and energy consumption. Precast also does not contribute to waste at the project site since it arrives ready for installation. More importantly in the long-run, precast itself can be recycled or, better yet, reused. In addition to waste reduction, precast construction reduces the cost and pollution associated with transportation. Precast concrete is essentially an abundant “natural” resource available locally which offers many advantages over materials such as structural steel that must be trekked across long distances to reach a local service area.

As a Design/Builder, we have a fiduciary responsibility to provide our clients with solutions that make sense in terms of long-term investment, serviceability, and sustainability. We must consider the cost of capital measured in time and delivery to market while building value for the client. Precast concrete checks the boxes on each of these critical project points. The advantages of precast are clear; it is quicker, more weather-resistant, more affordable, and more sustainable. Most importantly, precast concrete allows us to offer architecturally stunning solutions while keeping the project budget on target. 