TECH BRIEF

The Precast Advantage: Quality, Value, Permanence

By Dean A. Frank, P.E.

The average person likely is unaware of the presence of the hidden systems that make life what it is today: civilized. Sanitary and storm sewers, box culverts, catch basins, pump/lift stations, septic tanks, exterior grease interceptors, water storage tanks, wet wells, electrical and communication vaults and many other products all play a pivotal role in maintaining a clean, healthy, productive environment for the inhabitants of the civilized world. Without these systems, life would be much different. Much of the credit can be given to the main components of these systems, which typically consist of precast concrete.

Here's why you should specify precast concrete on your next project. With all the advantages of using precast concrete, it's no wonder the civilized world can depend on the inherent quality, value and permanence of precast concrete. ■

To find a manufacturer of this product in your area or for more information, visit NPCA's Web site at www.precast.org or call toll free (800) 366-7731.

Quality Control.
Because precast concrete products typically are produced in a controlled environment, they exhibit high quality and uniformity. Variables affecting quality typically found on a jobsite –temperature, humidity, material quality, craftsmanship – are nearly eliminated in a plant environment.

Strength.
The strength of precast concrete gradually increases over time. Other materials can deteriorate, experience creep and stress relaxation, lose strength and/or deflect over time. The load-carrying capacity of precast concrete is derived from its own structural qualities and does not rely on the strength or quality of the surrounding backfill materials.

Durability.
Studies have shown that precast concrete products can provide a service life in excess of 100 years. For severe service conditions, additional design options are available which can extend the life of the precast concrete product. This is extremely important when calculating life-cycle costs for a project.

Fire Resistance.
Precast concrete is noncombustible. Also, concrete does not lose its structural capacity nearly as quickly as steel, which is now a significant consideration as witnessed in the attacks on the World Trade Center and the towers' subsequent collapse. Other materials besides concrete and steel are flammable and/or do not perform well in elevated temperatures. Fiberglass begins losing structural integrity at 200 F. HDPE begins to melt at 266 F.

UV Sensitivity.
Unlike some other materials, precast concrete does not degrade from exposure to sunlight. This is extremely beneficial for above-ground applications.

Chemical Resistance.
Precast concrete is resistant to most substances. However, no material is completely immune to attack from aggressive chemical agents. Thus it is wise to choose the material with the longest expected service life. Precast concrete products can be designed to withstand anticipated corrosive agents.

Weather Resistance.
Precast concrete is well-suited for exposure to all types of weather conditions. In regions experiencing regular freeze-thaw cycles, the concrete mix can be designed to properly withstand damage.

Reduced Weather Dependency.
Precast concrete increases efficiency because weather will not delay production. In addition, weather conditions at the jobsite do not significantly affect the schedule. This is because it requires less time to install precast compared with other construction methods, such as cast-in-place concrete. Precast concrete can be easily installed on demand and immediately backfilled – there is no need to wait for it to cure.

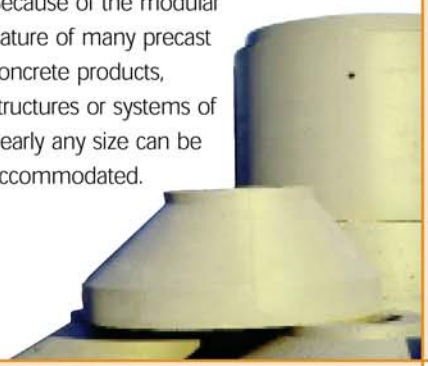
Watertightness.
Precast concrete products produced in a quality-controlled environment and used with high-quality sealants offer a superior solution to watertightness requirements. Standard watertight sealants are specially formulated to adhere to precast concrete, making watertight multiple-seam precast concrete structures possible.

Ease of Installation.
Although precast concrete is quite heavy, nearly all other competing materials require machinery for handling and installation as well. Besides, speed of installation is more dependent on excavation than product handling and placement. Precast does not require the use of special rigging (such as fabric slings) which must be used in order to avoid structural damage while handling materials such as fiberglass. Additionally, because precast products are designed and manufactured for simple connection, many components can be installed in a short time.

Buoyancy.
With a specific gravity of 2.40, precast concrete products resist the buoyant forces associated with below-grade construction. In comparison, fiberglass has a specific gravity of 1.86 and high-density polyethylene (HDPE) has a specific gravity of 0.97.

Mass.
Precast concrete products can act as effective barriers to vehicular traffic due their size and weight. In the current world climate, precast concrete products such as planters, bollards and highway barriers increasingly are being used to provide protection for a wide variety of venues.

Modularity.
Because of the modular nature of many precast concrete products, structures or systems of nearly any size can be accommodated.



Availability.
With thousands of manufacturers throughout North America, precast concrete products can be ordered from plants in most cities or regions. Since precast structures are manufactured in advance and stored at the plant, they are readily available when needed at the job site. This ensures competitive pricing and a ready supply, which can save days, weeks or even months on a project over cast-in-place concrete.

Efficiency.
Precast concrete products arrive at the jobsite ready to install. There is no need to order raw materials such as reinforcing steel and concrete, and there is no need to expend time setting up forms, placing concrete or waiting for the concrete to cure.

Aesthetics.
Precast concrete products are both functional and decorative. They can be shaped and molded into an endless array of sizes and configurations. Precast concrete can also be produced in virtually any color and a wide variety of finishes (acid-etched, sandblasted, smooth-as-cast, exposed-aggregate) to achieve the desired appearance for building and site applications.

Environmentally Friendly.
After water, concrete is the most frequently used material on earth. It is nontoxic, environmentally safe and composed of natural materials. Buried throughout the world, precast concrete products help convey water without contributing to poor water quality.

Low Maintenance.
Precast concrete requires little or no maintenance, which makes it an ideal choice for nearly any design solution.