



Solutions



OUR GOAL

OUR GOAL IS to exceed customer expectations and requirements with the highest quality products and services.

WE ACCOMPLISH THIS by integrating design, manufacturing and construction to deliver complete project solutions. Our unique system, based on creating value through knowledge, is how you, the customer, ultimately benefit.

These benefits include reduced risk, speed to market, improved competitive advantage and lower cost.

“SUSTAINABILITY”

Going “**Green**” with Building Sustainability – the World is Finally Coming Around to Our Way of Thinking.

What exactly does “green” mean? Encompassing terms ranging from “ecological benefits” to “environmental sustainability,” a precise definition of what makes a building “green” has yet to be officially established. In this publication, our purpose is not to propose such a definition, but rather to highlight “green” issues that make precast concrete construction **environmentally friendly and cost beneficial.**

precast concrete delivers significant

*** LEED POINTS**

at no extra cost

* References from the USGBC LEED New Construction & Major Renovation, Version 2.2 Reference Guide.

In This Issue

Learn about the strength of precast concrete construction and how it is inherently green – saving money for Owners while saving the environment.

Learn more at www.finfrockdmc.com



Rightfully, much of the world's attention is now being focused on the environment. The need is immediate and urgent as we realize that **people are using more resources than are being regenerated.**

Choices made in building construction can have major environmental impact issues throughout the entire life cycle of the structure – and beyond. From construction to demolition, building materials affect everything from the preservation of resources to landfill management to energy consumption to the release of greenhouse gasses.

To put things into perspective, consider some basic facts presented by Martha VanGeem, P.E. in an article written for the PCI Journal. "Buildings consume 65% of the electricity generated in the United States and more than 36% of the primary energy (such as natural gas); produce 30% of the national output of greenhouse gas emissions; use 12% of the potable water in the United States; and employ 40% of raw materials – 33 billion tons annually for construction and operations."

Given these figures, building sustainability has more importance than ever. The World Commission on Environment and Development defines sustainability as "development that meets the needs of the

present without compromising the ability of future generations to meet their own needs."

To this end, we see "sustainability" as the aspects of a building that minimize its environmental impact and increase efficiency across its entire life cycle. Finrock's unique Design-Manufacture-Construct project delivery system has enabled us to build a long-standing tradition of providing solutions that are energy conscious, durable, flexible, productive, and cost effective throughout an extended life span.

In her article, VanGeem also points out that "while other building materials may have to alter their configurations, properties, or both to be applicable to sustainable structures, precast concrete's inherent properties make it a natural choice for achieving sustainability with today's new buildings."

We wholeheartedly agree.

Precast concrete's inherent properties make it a natural choice for achieving sustainability with today's new buildings.



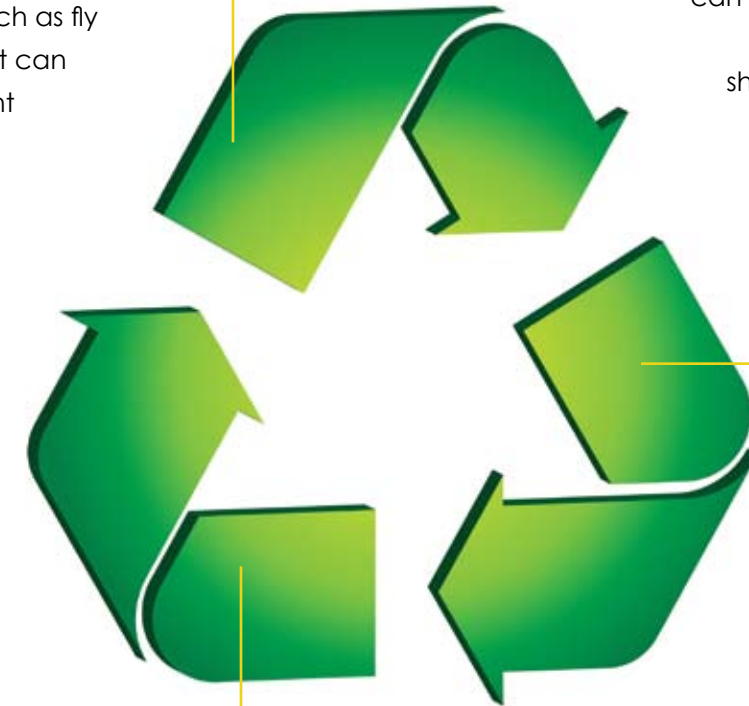
REDUCE, REUSE, RECYCLE – THE "THREE R'S" OF SUSTAINABILITY

REDUCE

The choice of precast concrete reduces the amount of material used as well as the toxicity of waste materials, according to the VanGeem article. Substituting industrial waste products such as fly ash or slag cement can reduce the amount of cement used in the precast process. Adding recycled waste concrete can also reduce the need for aggregate product.

REUSE

Precast concrete panels can be reused when buildings are updated or expanded. Concrete pieces from demolished structures can be reused as artificial reefs or to protect endangered shorelines. And because the precasting process is self-contained, formwork and finishing materials are reused over and over again.



RECYCLE

Concrete from Finrock's manufacturing plant is recycled as fill or road base materials. Most of our reinforcing steel is made from recycled steel. Other materials, such as wastewater, is recycled into the concrete mix.





WORKING GREEN FROM DESIGN...

START WITH AN INTEGRATED, MULTI-DISCIPLINED TEAM

Finrock's in-house team of designers, architects and engineers work closely with our manufacturing and construction teams to create building solutions that can be precisely manufactured and efficiently built. The use of precast components allows designers to create expansive interior spaces that can be easily and efficiently reconfigured. This extends the structure's useful life while minimizing waste. Because the design team includes a full range of disciplines, maximum efficiencies can be incorporated into utilities, systems and operating functions. Because components are made to close tolerances, construction is fast and easy. This further reduces energy consumption and environmental impact at the jobsite. The control afforded by this fully integrated, design-build team **provides benefits to the owner as well, in terms of speed to market, lower construction costs and reduced environmental concerns.**

"The use of precast components allows designers to create expansive interior spaces that can be easily and efficiently reconfigured. This extends the structure's useful life while minimizing waste." ←





...THROUGH MANUFACTURE-CONSTRUCT

PRECAST MANUFACTURING EFFICIENCY

Finrock's manufacturing of precast concrete components is a very precise and exacting process. **We require fewer materials due to the closely controlled manufacturing processes and use of high-strength materials.** Our production tolerances are the highest achievable so less waste is generated. Most waste concrete is recycled directly on site by being crushed to reuse as aggregate or to be applied across the plant as road base. Our level of strict control throughout the entire manufacturing process results in environmental benefits in terms of using fewer raw materials and less energy in manufacturing. It also reduces emissions from mining, processing and transporting raw and finished materials. **To our clients it means these efficiencies translate into economic benefits as well in terms of more competitive pricing.**

BUILT IN FLEXIBILITY FOR LONGER LIFE

The optimization of materials, due to prestressing, in precast concrete construction results in much less concrete being required as compared to cast-in-place structures. Finrock's fully integrated Design-Manufacture-Construct project delivery system provides more efficient structural components, longer interior spans and less material used on site. Long, precast

interior spans create vast open space and eliminate the forest of support columns inherent in other structural systems. **The versatility of such interior room extends the building's useful life. The space can be quickly and economically reconfigured** to meet changing demographic or utilitarian needs. This is especially important where land is at a premium such as in urban centers or college campuses. Precast structures can support an ever-changing mix of office, retail, restaurant, medical, meeting space, classroom or residential applications. **This provides environmental savings as well as economic benefits for owners.**

LEAVE THE CAR PARKED

The most difficult aspect of vertically mixed-use facilities is providing economical parking. Finrock's precast concrete components have the ability to honor the parking module while accommodating the design load requirements for a variety of uses. By integrating a strategic combination of retail, restaurant, office, classroom and residential elements, such structures enable residents to leave their cars parked while they attend to the majority of their daily affairs. **Owners benefit when more urban sites become available for development rather than parking cars.**

DELIVER TOP QUALITY FIT AND FINISHES

The precision of the Finrock manufacturing process delivers internal and external components of superior quality. Structurally efficient columns, beams and slabs fit together with close tolerances so they can be left exposed in their natural finishes. Interior and exterior walls offer a wide variety of color, shape and texture options, and floors can be highly polished with stain accents added. The quality of these finishes reduces the need for the production, installation, maintenance, repair and replacement of additional build-out materials. **Owners gain the benefit of reduced initial costs as well as reduced maintenance costs.**

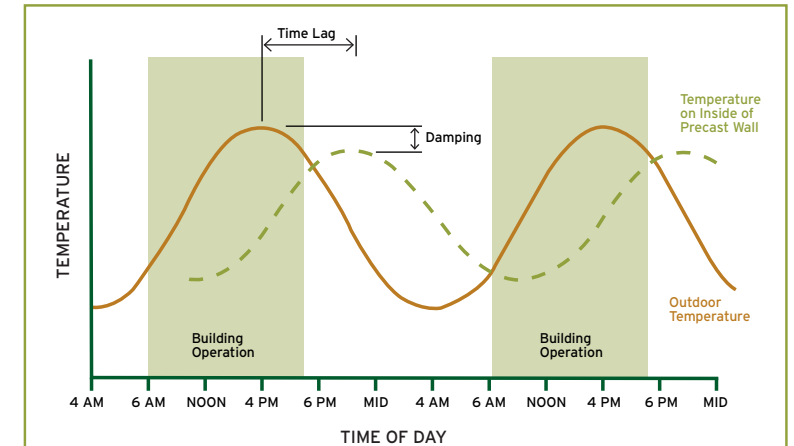
IMPROVE ENERGY EFFICIENCY

The thermal mass of precast concrete slows the transference of heat. This means it takes longer for outside temperatures to affect interior spaces. **The result is that heating or cooling the building requires less energy because interior temperatures remain more constant** than those in structures subject to the large daily "spikes" that occur as outside temperatures vary from morning to night. **Owners benefit when the size of HVAC equipment can be reduced, saving money and energy.**

MAKE IT EASIER TO SAY GOOD-BYE

While the concrete and steel elements used

to manufacture precast components have a virtually limitless life span, things do change. The flexibility of the expansive interior spaces of a precast structure can accommodate most



Thermal resistance (R-values) and thermal transmittance (U-factors) do not take into account the effects of thermal mass, and by themselves, are inadequate in describing the heat transfer properties of construction assemblies with significant amounts of thermal mass.

changes, but there may come a time when the building must be demolished to make way for a new use. When that day arrives, precast reduces the impact on the disposal of materials. **The bulk of major structural components can be easily recycled.** Reinforcing steel can be reprocessed. The concrete can be used in large pieces as artificial marine habitat elements or for shoreline protection. When crushed, the spent concrete can be reapplied as a road building material or to be used as aggregate in making new concrete. **Because many interior elements can be left unfinished, a precast structure has less wood framing, drywall and other finish elements that Owners must send to a landfill. ■**

SUSTAINABILITY BENEFITS – A TRIPLE BOTTOM LINE

The big picture goal of sustainability is to deliver across a triple bottom line that includes environmental benefits, societal benefits and economic benefits. The inherent advantages that precast concrete construction brings to the sustainability equation **today** can pay immediate dividends. Let us review the benefits in each of these areas.

ENVIRONMENTAL BENEFITS

- Precast uses less raw materials
- Raw materials are abundant and close at hand – reducing energy consumption for mining and transportation
- Manufacturing reuses waste materials in concrete mix
- Concrete can be recycled in forms ranging from artificial reefs to road base
- Key precast structural components – concrete and steel – have a virtually limitless life span, which extends the productive life of buildings
- Reinforcing steel is easily recyclable when and if the building is demolished
- Expansive interior spaces of precast structures provide tremendous flexibility enabling the building to keep pace with ever changing demographic and economic demands for long life
- The thermal mass of precast concrete reduces energy consumption and reduces urban heat islands
- Precast structures are resistant to wind, rain, fire, flood, insects and a host of natural forces that would reduce ordinary structures to landfill mass
- The precision manufacturing and quality finish of precast components reduce the need for additional interior finish materials that could impact indoor air quality and provide more waste materials should the building be remodeled or removed

SOCIETAL BENEFITS

- Healthy indoor environments provide for more productive workers, more attentive students and all around well being
- Precast construction greatly reduces the impact of exterior noise and airborne noise transmission between floors, which enable the structures to provide ideal work, study or residential environments
- Highly-efficient, mixed-use structures can make the most of congested urban locations and deliver essential daily services without the need for a car
- Minimal use of essential resources makes more available elsewhere
- Precast concrete buildings can be easily expanded, updated or remodeled to fit community needs

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Perhaps most important, precast concrete structures can deliver these sustainability benefits right now. There is no need for expensive re-engineering, re-configuring or re-formulating of materials. Finrock’s unique, turnkey Design-Manufacture-Construct project delivery system has a long-standing and well-earned reputation for delivering positive results across this very important triple bottom line.

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ECONOMIC BENEFITS

- Finrock’s integrated Design-Manufacture-Construct project delivery system provides early, accurate estimates to prove financial viability of the project
- Daily communication between in-house designers, manufacturing experts and construction managers creates economic efficiencies and reduces cost
- Precast components are designed to be manufactured efficiently and with close tolerances, which speeds construction, lowers cost and brings the finished project to market faster
- Precast concrete structures can include integral parking, making them an ideal fit for virtually any property footprint
- Expansive interior spaces can be easily and inexpensively reconfigured to accommodate virtually any need or application
- Precast concrete structural components resist the elements to reduce maintenance, repair and replacement costs
- By the very nature of its structural elements, a precast concrete structure resists natural forces and reduces the risk of business interruption
- Precast concrete resists heat intrusion, reducing operational energy costs
- The inherent sustainability of precast concrete construction makes the structure environmentally sound and neighborhood friendly ■

LEED POINTS AVAILABLE FROM...

Reducing, Reusing and Recycling Precast Concrete	
MR Credit 1.1 - 2	Building Reuse
MR Credit 2.1	Construction Waste Management: Divert 50% From Disposal
MR Credit 3.1 - 2	Material Reuse
MR Credit 4.1 - 2	Recycle Content

Finrock’s Design-Manufacture-Construct Project Delivery System	
SS Credit 5.1	Site Development: Protect or Restore Habitat
SS Credit 5.2	Site Development: Maximize Open Space
ID Credit 1.1 - 4	Innovation in Design
ID Credit 2	LEED Accredited Professional

A Total Precast Structure	
SS Credit 7.1	Heat Island Effect: Non-Roof
SS Credit 7.2	Heat Island Effect: Roof
EA Credit 1	Optimize Energy Performance
MR Credit 5.1-2	Regional Materials
EQ Credit 3.1	Construction IAQ Management Plan: During Construction
EQ Credit 7.1	Thermal Comfort: Design

* References from the USGBC LEED New Construction & Major Renovation, Version 2.2 Reference Guide.



DURABILITY PAYS DIVIDENDS

The inherent durability of a precast concrete structure pays significant dividends in terms of reducing the costs of repair, maintenance and replacement. The characteristics of precast concrete make it sustainable in two important ways – by avoiding contributing solid waste to landfills and by reducing the depletion of natural resources as well as the air and water pollution associated with replacement construction. A precast concrete structure is resistant to many of the natural elements that annually destroy or render useless ordinary structures.

SEVERE WEATHER Due to its mass, a total precast concrete structure is highly resistant to tornadoes, hurricanes, rain and wind. The piles of debris strewn across Florida following the hurricanes of 2004 were powerful testament to the severe economic and environmental impact made by failed structures.

"Hurricane Frances sat directly over West Palm Beach for 22 hours and Finrock's building didn't suffer a single leak," said Mike Steger, Director of Maintenance at Palm Beach Atlantic University.

FIRE The noncombustible nature of precast concrete helps contain a fire. As a separation wall, precast concrete keeps fire from spreading within a structure or jumping from building to building. During wildfires, precast concrete walls provide protection for

occupants and their possessions. As an exterior wall, concrete that endures a fire can usually be reused when the building is rebuilt.

When buildings resist these natural forces, Owners gain the benefit of reduced risk of interrupted business.

FLOOD Precast concrete is not damaged by water and can be submerged for long periods of time. In flood-damaged areas, concrete buildings are the most salvageable.

HIGH HUMIDITY AND WIND-DRIVEN RAIN Especially important in hot, high humidity climates, precast concrete is resistant to wind-driven rain and moist outdoor air. Concrete is impermeable to air infiltration and is not damaged by moisture.

INSECTS AND PESTS

Precast concrete is inedible, so it cannot be damaged or destroyed by vermin. Due to its hardness, insects will not bore through concrete. ■

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www.finrockdmc.com/solutions

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