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GROWTH

THE BENEFITS OF  
FIBER-REINFORCED  
CONCRETE

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# Chair's Insights

A MESSAGE FROM NPCA CHAIR WILLIAM J. BUNDSCHUH



William J. Bundschuh  
NPCA Chair of the Board

**The Precast Show brought together more than 5,300 manufactured concrete industry professionals, including producers, suppliers and specifiers, to get the business of concrete done.**

If The Precast Show 2024 is any indication, the precast concrete industry is in for another great year.

Held in Denver on Feb. 8-10 this year, The Precast Show brought together more than 5,300 manufactured concrete industry professionals, including producers, suppliers and specifiers, to get the business of concrete done. Some great new technologies and tools debuted, and hundreds of important deals were made to keep our plants running smoothly. But, more importantly, relationships were started or built upon that will evolve into lifelong partnerships and even friendships. You couldn't go 5 feet across the Show floor without seeing smiles and handshakes or hearing laughter. That's always a sign of a good (and productive) show.

It was encouraging to see so many young faces on the Show floor. The next generation is stepping up to lead the way in reshaping our nation's infrastructure. From the students participating in the NPCA Foundation Student Design Competition to the rising leaders at family-owned facilities, it's evident this industry's future is in good hands.

As we turn our focus from The Precast Show to the months ahead, I'm working with our Board of Directors and the great NPCA staff to execute initiatives to reach the goals of my term as your Chair.

First, I want members large and small to find value within NPCA. Whether it's utilizing NPCA's onboarding program to improve retention and boost productivity or participating in the association's webinar series, you can benefit from being a part of and using the tools provided by this tremendous organization. Better yet, you can make a difference by getting involved in NPCA Committees or the NPCA Foundation. Your membership is what you make of it.

Secondly, we are stronger together and get more done with a single voice. I intend to further develop our relationships with other industry associations. Wouldn't it be great to see them all at next year's The Precast Show in Indianapolis?

And, finally, there are opportunities to utilize our Research and Development fund as it was intended: to advance our industry's needs. Stay tuned for more details from NPCA in the coming months about projects that will make a difference for your company.

There's work to be done. Let's do it together.

# CEO Report

NPCA PRESIDENT & CEO NICK RHOAD LOOKS AHEAD



**Nick Rhoad**  
NPCA President & CEO

**I appreciate those of you who have taken the time to share your insights and knowledge with me. What we learn from all of you helps the NPCA team support the precast concrete industry and add value for members.**

I have been to my share of association meetings and trade shows in my career, but I have never seen anything quite like The Precast Show. From the exhibit floor to the Master Precaster graduation to the educational offerings, it was an amazing show.

The best part of the show for me was the chance to meet so many NPCA members from across the country. As many of you know, since my first day I have made it a priority to meet with members, tour your plants and learn about your needs and the needs of the industry. I appreciate those of you who have taken the time to share your insights and knowledge with me. What we learn from all of you helps the NPCA team support the precast concrete industry and add value for members.

With that in mind, I am excited to share that in response to industry demand, NPCA launched its introductory Production & Quality School class (PQS I) in Spanish in early March. PQS I joins our Spanish language safety courses. We are currently evaluating the development and launch of PQS II in Spanish, which will be based in part on industry response to the Spanish language PQS I, as well as developing a Spanish version of the Onboarding program.

NPCA members also have shared with me and others on staff some of the challenges the industry faces from local and state government policies and regulations. While NPCA has eyes on Washington, D.C., we recognize there is an opportunity to engage more actively on the local and state level and to help you, our members, be an effective voice for the industry. Stay tuned as we grow our government advocacy programs and develop more resources for you. In the meantime, please feel free to pass along news about local and state government activities that affect our industry.

I walked away from TPS excited about the industry and the opportunities on the horizon. I look forward to exploring those opportunities and finding ways NPCA can strategically work to grow the industry and help members take advantage of the opportunities that lie ahead.





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# Government Insights

## ADVOCATING FOR THE PRECAST CONCRETE INDUSTRY



By Barbara Burchett

Barbara Burchett is co-principal of Innovative Advocacy, which works with NPCA to advance the interests of the precast concrete industry in Washington, D.C.

### DECODING THE FEDERAL ALPHABET SOUP REVEALS ASSOCIATION'S EFFORTS

Recently, NPCA staff has been working on national level issues to develop programs and initiatives that maximize benefits to NPCA producers. Here is a brief review of acronyms you may have encountered recently and an explanation of NPCA's work on the federal level:

#### EPDS

An environment product declaration, or EPD, is a document that transparently communicates the environmental performance or impact of any product or material over its lifetime. Within the construction industry, EPDs support carbon emission reduction by making it possible to compare the impacts of different materials and products to select the most sustainable option. An EPD is usually valid for five years and is generated according to the relevant standards. Construction

EPDs are based on the ISO 14040/14044, ISO 14025, EN 15804 or ISO 21930 standards. EPDs help to achieve EPD and life-cycle assessment credits in certifications like LEED, BREEAM and others.

To date, EPDs in construction projects and manufacturing are voluntary. However, their use is rapidly growing in line with awareness about environmental impacts; to satisfy marketplace and consumer interests; and greenhouse gas emission objectives of federal, state and local governments. To that end, federal government efforts are under way to reduce the embodied carbon of construction materials and products through Buy Clean programs. Under the Inflation Reduction Act that Congress passed and President Joe Biden signed in 2022, the EPA and other federal agencies are required to address embodied carbon of construction materials.

To meet that objective, the U.S. EPA is undertaking a grant program called Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products. The goal of the grant program is to support businesses that manufacture construction materials and products to develop and verify EPDs, and to states and nonprofit organizations that will support such businesses. The Notice of Funding Opportunity (NOFO) closed Jan. 16. The anticipated notification of funding selection is May 1, with anticipated awards made in the summer.

An environmental product declaration can help specifiers determine the most sustainable option for a construction project.





## NPCA JOINS WITH INDUSTRY ALLIES FOR EPA GRANT PROGRAM ON EPDS

In January, NPCA and the American Concrete Pipe Association (ACPA) filed a grant application with the Environmental Protection Agency (EPA) as subrecipients with the Precast/Prestressed Concrete Institute (PCI) as the primary grant applicant/recipient. This industry partnership is formed to implement the Precast Concrete Carbon Reporting (PCCR) project, empowering precast concrete manufacturers to develop and produce compliant EPDs. The funding request is \$9,975,000 for the project spanning a required five years.

In Precast Today Q4 2023, we laid out how a company can complete an EPD to present transparent, verified and comparable information about the life-cycle environmental impact of its products.

## PLAS

A Project Labor Agreement (PLA) is a type of collective bargaining agreement unique to the construction industry. They can be used in pre-hire collective bargaining agreements negotiated between construction unions and construction contractors that establish the terms and conditions of employment for construction projects.

Calling for the use of PLAs and PLA preferences on federal and federally assisted construction projects has become government policy under the Biden Administration's "Bidenomics," but took hold in 2009 when President Barack Obama signed Executive Order 13502, "Use of Project Labor Agreement for Federal Construction Projects" that encouraged executive agencies to consider requiring the use of PLA on large-scale direct federal construction projects defined as a total cost of \$25 million or more.

In 2022, Biden issued a new Executive Order 14063 requiring PLAs for most large-scale federal construction projects where total estimated cost to the Federal Government is \$35 million or more.

## NPCA JOINS COALITION OPPOSING THE IMPLEMENTATION OF THE BIDEN EXECUTIVE ORDER

Along with a diverse group of construction and business associations whose membership employs millions of construction industry professionals, NPCA asked U.S. Senators and Representatives to pass legislation opposing this policy of pushing controversial and anti-competitive PLAs on federal construction projects funded by U.S. taxpayers.

The signers state that PLA mandates artificially exacerbate a significant shortage of construction industry skilled labor, discourage competition from large, small and disadvantaged construction businesses; and needlessly increase construction costs.

The coalition encourages the Fair and Open Competition Act

(FOCA) legislation as a solution to the pro-PLA rule. The bills the coalition supports are HR 1209, led by Congressman James Comer of Kentucky in the House, and S. 537, by Senator Todd Young of Indiana. FOCA seeks to counteract the special interest bias by prohibiting federal agencies from mandating PLAs. Instead, federal agencies would be able to award contracts to businesses that voluntarily utilize PLAs before or after a fair and open competitive bidding process. Twenty-five states already have laws like FOCA for state and local government procurement of construction contracts. This approach promotes fairness, efficiency and transparency in government contracting.

## GHG

Greenhouse gases (GHG) trap heat in the atmosphere. These gases include carbon dioxide, methane and fluorinated gases.

Each gas's effect on climate change depends on three main factors: concentration, or abundance, of a particular gas in the air; the length of time greenhouse gases stay in the atmosphere and the impact of the gases in the atmosphere.

For each greenhouse gas, a Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, typically a 100-year time horizon, relative to the emissions of 1 ton of carbon dioxide (CO<sub>2</sub>). Gases with a higher GWP absorb more energy, per ton emitted, than gases with a lower GWP, and thus are designated as contributing more to warming Earth.



## NPCA SIGNS LETTER ON FHWA GREENHOUSE GAS EMISSIONS PERFORMANCE MEASURE RULE

NPCA signed a letter in February supporting Congressional efforts to halt the greenhouse gas regulation that was finalized on Nov. 23. Under the new rule, the Federal Highway Administration can impose GHG emissions performance measures on state departments of transportation and metropolitan planning organizations despite having no authority from Congress to do so under the Infrastructure Investment and Jobs Act (IIJA). One significant effort in Congress is the use of a Congressional Review Act or CRA. This is a Joint Resolution of Disapproval to nullify the FHWA rule and illustrates Congress' objection to the overreach by the FHWA. Co-sponsors on Capitol Hill of the bicameral CRA are Congressman Rick Crawford (R-Arkansas), Senator Kevin Cramer (R-North Dakota), along with Congressman Sam Graves (R-Missouri) and Senators Shelley Moore Capito (R-WV) and Joe Manchin (D-WV).

The letter was posted to the House Transportation and Infrastructure Committee website.

# Questions from the Field

QUESTIONS FROM THE FIELD IS A SELECTION OF QUESTIONS NPCA TECHNICAL SERVICES ENGINEERS RECEIVED FROM CALLS, EMAILS, PLANT EVALUATIONS AND COMMENTS ON BLOG POSTS OR MAGAZINE ARTICLES POSTED TO PRECAST.ORG

If you have a technical question, contact us by calling (800) 366-7731 or visit [Precast.org/ask](https://www.precast.org/ask)

BARTHOLOMEW ASKS:

## **DOES A KNUCKLE BOOM TRUCK DRIVER/OPERATOR NEED TO BE OSHA CRANE CERTIFIED?**

NPCA TECHNICAL EXPERTS ANSWER:

In 2008, the Occupational Safety and Health Administration (OSHA) first proposed draft language requiring operators of cranes and other equipment as outlined in OSHA 1926.1400 be certified. The proposal was accepted in 2010 and went into effect on

Nov. 10, 2014. This certification requirement was based on “equipment capacity and type.”

To think that OSHA didn’t have any requirements for crane operators before 2014 would be in error. In 1979, OSHA published 29 CFR 1926.550, which included a requirement identifying “an employer’s duty to comply with manufacturer specifications and limitations” (Sec. 1926.550(a)(1)). Employers were subject to general requirements elsewhere in OSHA construction safety standards that required employers to permit only those employees “qualified by training or experience” to operate equipment. They



NPCA FILE PHOTO





In 2018, OSHA updated crane certification requirements to reduce the burden on the employer to maintain certification based on capacity.

also had to “instruct each employee in the recognition and avoidance of unsafe conditions.” However, these requirements were deemed insufficient for safety in the workplace.

Since the 2010 crane standard went into effect, there has been some pushback from certifying agencies on why type and capacity are needed for certification. After discussion with industry, OSHA updated the certification requirements based on either type OR type and capacity on Nov. 9, 2018. This update reduces the burden on the employer to maintain certification based on capacity. Instead, an employee can be certified for a type of equipment regardless of capacity.

Section 1926.1400(c) outlines equipment excluded from the scope of this requirement. The articulating/knuckle-boom truck is identified as exempt when:

- ▶ Delivering material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting.
- ▶ Delivering material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning automatic overload prevention device.

However, this exclusion does not apply when:

- ▶ The articulating/knuckle-boom crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure.
- ▶ The material being handled by the articulating/knuckle-boom crane is a prefabricated component. Such prefabricated components include but are not limited to: precast concrete members or panels, roof trusses (wooden, cold-formed metal, steel, or other material), prefabricated building sections such as but not limited to floor panels, wall panels, roof panels, roof structures, or similar items.

Therefore, when using an articulating/knuckle-boom crane to handle precast concrete components, the operator must be certified according to OSHA 1926 requirements.

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## THE BENEFITS OF

# Fiber-Reinforced Concrete

## in Precast Applications



By Michael Mahoney

Michael Mahoney is a licensed professional engineer and director of marketing and technology for fiber-reinforced concrete at Euclid Chemical. He is a fellow and member of the American Concrete Institute and has served on various committees for the National Precast Concrete Association and American Society for Testing and Materials. To learn more, visit [euclidchemical.com](http://euclidchemical.com).

### COST-EFFECTIVE, DURABLE AND SUSTAINABLE PRODUCT A POPULAR CHOICE FOR PRECAST

As the demand for more sustainable construction grows and shortages of raw materials like steel continue to be a challenge, fiber-reinforced concrete has become an increasingly popular choice for both poured-in-place and precast applications.

Fiber reinforcement makes concrete significantly more resistant to cracking from plastic and drying shrinkage, leading to a highly durable end product with a longer lifespan. Some fiber types can even greatly reduce construction time and, in some applications, completely eliminate the need for conventional steel.

Although fiber has long been employed to improve the durability of precast concrete, it hasn't been implemented as a complete substitute for conventional reinforcement. However, the creation of ASTM C1765 — Standard Specification for Steel Fiber-Reinforced Concrete Culvert, Storm Drain and Sewer Pipe in 2013 along with various DOT and other municipal standards have set the foundation for incorporating different types of fiber as a prospective choice for precast reinforcement in the future.

#### WHY USE FIBERS IN PRECAST CONCRETE?

Regarded as a cost-effective, durable and even sustainable alternative to conventional steel like rebar and wire mesh, fiber-reinforced precast concrete boasts a variety of benefits such as:

- ▶ Preventing plastic and drying shrinkage cracks
- ▶ Increasing production speed and reducing labor costs
- ▶ Eliminating the need for storage and installation of standard steel reinforcement in precast elements
- ▶ Lowering material storage and transportation costs
- ▶ Reducing precast element breakage.

Plus, unlike steel reinforcement, fiber is mixed throughout the entire precast element, which eliminates concrete cover requirements. In certain cases, this will even allow for a reduction in element thickness and weight.

#### TYPES OF FIBER REINFORCEMENT

The prevalent types of fiber currently utilized in the precast industry are steel, polypropylene and fiberglass. Steel fibers, primarily produced from carbon or stainless steel, play a crucial role in the prevention of cracking in concrete products, with varying geometries designed by manufacturers. Commonly applied in floor slab construction, steel fibers are increasingly being used in other precast structures such as concrete tanks.

Polypropylene fibers, belonging to the synthetic fiber category, offer similar benefits to precast products as steel alternatives. With characteristics akin to steel, polypropylene fibers are employed to prevent cracks and enhance durability, finding applications in precast structures such as septic





**Fiber reinforcement makes concrete significantly more resistant to cracking from plastic and drying shrinkage, leading to a highly durable end product with a longer lifespan.**

NPCA FILE PHOTO

tanks and burial vaults. These fibers are further divided into two categories of micro and macrofibers. Synthetic fiber concrete reinforcement resists rust, ensuring performance throughout the concrete's lifespan.

Glass fibers are primarily used for architectural purposes. When added to a concrete mix, glass fibers enable the production of thin decorative elements and cladding systems with minimal weight, thereby reducing loading and providing excellent thermal properties.

Despite these advantages, some challenges remain in the widespread adoption of fiber reinforcement. Variability in the sizes and shapes of fibers complicates the selection process for specific projects, especially without comprehensive standards. Ensuring uniform fiber distribution in precast structures also requires further attention for consistency across different mixes.

## **HOW SYNTHETIC FIBERS COMPARE TO STEEL REINFORCEMENT**

Although synthetic microfibers provide superior resistance to plastic shrinkage cracking over welded wire reinforcement, they aren't resistant to expanding crack width openings caused by drying shrinkage, structural load or other forms of stress. However, these fibers can — and should — be regularly specified in any concrete type to improve cracking resistance, spall protection, freeze-thaw durability and concrete homogeneity during placement. Microfibers are available in ½-inch to ¾-inch (12 – 19 mm) lengths, with dosage rates varying from 0.5 – 1.5 lbs/yd<sup>3</sup> (0.3 – 0.9 kg/m<sup>3</sup>) depending on the fiber product and application type.

Synthetic macrofibers not only provide resistance to plastic shrinkage but also enhance concrete's durability, toughness and limited structural capacity when properly designed. Dosed at amounts equivalent to conventional reinforcement, these fibers

Macrofibers are non-magnetic and non-corrosive, making them ideal for exterior precast where aesthetics and safety are a concern.

are distributed three-dimensionally throughout the concrete section. Synthetic macrofibers can be likened to the use of steel fibers but are usually easier to place and finish due to their lighter weight, non-corrosive nature and high pumpability. Macrofibers are typically 1 ½ inches to 2 inches (38 – 50 mm) in length, with dosage rates varying from 3.0 – 15 lbs/ yd<sup>3</sup> (1.8 – 9.0 kg/m<sup>3</sup>) depending on the fiber product and application type.

With all of this considered, can synthetic fibers compete “head-to-head” with steel? Absolutely! Macrofibers offer durability and residual strength capacity equivalent to steel. Assuming an adequate fiber design is performed, synthetic macrofibers generally require five to 10 times less weight of material compared to steel, streamlining on-site handling and storage. They are also non-magnetic and non-corrosive, making them ideal for exterior precast where aesthetics and safety are a concern. Since concrete containing macrofibers is mixed, the fiber also becomes somewhat pliable and not nearly as abrasive to pumping lines and equipment.

### DESIGN CONSIDERATIONS FOR FIBER-REINFORCED PRECAST CONCRETE

Fiber-reinforced precast elements are typically designed by a licensed professional. However, when a design requires a certain wall thickness to resist all flexural and bending conditions applied with conventional steel, the dosage rate of fiber can be calculated directly from the specified steel reinforcement that acts as an equal or better reinforcing option under the same conditions.

The use of fiber-reinforced concrete in this type of system can be and has been successfully implemented to achieve a more durable and economical structure. It should be noted that this analysis is valid only for single-layer reinforcement where distributed steel is evenly spaced. This procedure is also very well suited to precast elements where the steel has been designed to act as temperature and shrinkage reinforcement.

For thin wall precast, poured-in-place and shotcrete applications where specified steel is distributed and has already been designed,

**Compared to more established options like rebar or welded wire, fiber reinforcement represents a less mature industry, but the versatility of fiber ensures its place in modern precast operations.**



the use of synthetic macrofiber reinforcement can be used and calculated to provide an equivalent moment capacity in bending as the originally specified steel.

This analysis also considers the location of the steel and assumes that the existing reinforcement has been correctly placed in the concrete as designed. It is also assumed that all other concrete placement and finishing practices have been properly applied.

Standardized test methods, such as ASTM C1609 — Standard Test Method for Flexural Performance of Fiber-Reinforced Concrete, measure the post-crack performance capacity of fiber-reinforced concrete. This performance value is commonly referred to as “residual strength” or toughness. Once the required flexural residual strength has been established, the appropriate dosage of fiber can be calculated by converting the residual strength to a moment capacity provided for by the steel reinforcement, as determined in accordance with ACI 544.4R — Guide to Design with Fiber-Reinforced Concrete. Some fiber manufacturers provide mobile applications that provide easy conversions of single-layer conventional reinforcement to appropriate dosage rates of fiber reinforcement.

### CONCRETE MIX DESIGN FOR PRECAST APPLICATIONS

Adding fiber often reduces the slump of a concrete mix, which measures the workability of fresh concrete during placement. This is likened to adding more ingredients to the mix and, therefore, requires more fluid to maintain an apparent slump — hence the appearance of workability loss. Microfibers, used at typical dosages, generally only decrease slump slightly and don’t require significant changes to maintain placement characteristics. Yet, synthetic macrofibers and steel fibers can affect the workability of concrete in a more significant way, depending on fiber type and dosage.

To improve the workability of fiber-reinforced concrete, the ACI 544.4R standard offers recommendations and guidance to potentially modify the mix design. Additionally, the use of chemical admixtures like superplasticizers or water reducers increase the



workability of concrete without adding water. It is recommended that trial batches are performed to ensure mixture workability.

Factors such as fiber material type, architecture, dimension and dosage may affect the surface finish of fiber-reinforced precast. Stiff or rigid fibers typically have a greater tendency to protrude up through the element than flexible fibers. If necessary, a torch can burn off synthetic fibers on a concrete surface — but should not be used until all desired hardened concrete properties are achieved.

Proper external vibration is another key factor to consider in the production of fiber-reinforced precast concrete. The general recommendation is to use the same consolidation techniques and approximate timing as with conventional concrete.

Compared to more established options like rebar or welded wire, fiber reinforcement represents a less mature industry, but the versatility of fiber ensures its place in modern precast operations. Ongoing research and innovation continue to uncover exciting possibilities in this evolving field.



Macrofibers offer durability and residual strength capacity equivalent to steel.



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# Transforming the Future of Onsite Wastewater Systems

## OPPORTUNITY ABOUNDS FOR PRECASTERS WHO STAY AHEAD OF CHANGING WASTEWATER LANDSCAPE



By Ron Naumann

Ron Naumann, P.E., is the director of technical support at NPCA.

Onsite wastewater systems are changing ... and growing.

The past perception that onsite wastewater systems were merely a temporary solution, waiting for municipal wastewater infrastructure to catch up with residential areas, has shifted. Onsite wastewater systems are no longer seen as a stopgap measure; instead they are recognized as a solution, gaining increased attention and support from government agencies. The U.S. Environmental Protection Agency (EPA) has stated “decentralized systems are an integral component of our nation’s wastewater infrastructure and can protect public health and water quality.”

The EPA continues to reaffirm their commitment to decentralized wastewater solutions through their collaboration with state and local governments and national organizations to improve overall performance and management of decentralized systems. With a focus on community collaboration, technological innovation and environmental sustainability, the future of these systems appears brighter than ever.

### ONSITE WASTEWATER SYSTEMS TODAY

The typical residential wastewater system today is designed for a single residence. The influent (waste coming from the residence) flows into the tank, which is typically designed for a flow rate of 100-120 gallons per day per bedroom. The tank is sized to contain the







influent long enough to have gravitational forces separate the lighter floating material like oils, fat and grease and the heavier sinking solids from the wastewater and also enable some biological treatment. The effluent (discharge from the tank) can then flow into a drain field (or leach field) to be processed by the bacteria and microbes in the soil to clean the water before finally flowing into the main water table or aquifer. The system is not typically designed to withstand any kind of traffic, and the drain field area is typically not available for any other purpose.

Some septic systems also include a secondary wastewater treatment chamber where microbes purify the wastewater in the tank before it flows out into the drain field. These microbes are classified as either aerobic, requiring oxygen to live and perform their duty, or anerobic, which requires a reduced oxygen environment to survive. This secondary chamber may be required by some jurisdictions.

### **CLUSTER/COMMUNITY SYSTEMS: A SUSTAINABLE APPROACH**

According to the EPA, more than one in five households in the U.S. depend on individual septic (decentralized) systems or small community cluster systems to treat their wastewater.

The recent pandemic and the subsequent increase in people working from home has also resulted in people migrating to rural areas. This is likely to further increase the number of people dependent on decentralized treatment systems.

With housing subdivisions growing and rising in popularity in non-sewered rural areas or semi-rural areas, housing developers are constructing residential dwellings in closer proximity to each other. In the past, the traditional septic tank and drain field solution was not always a viable solution due to reduced lot sizes or non-suitable soil for the drain field. However, thanks to the evolving onsite wastewater demand, new ideas like mass drain fields for community wastewater systems have arisen.

Community systems are designed slightly differently than the traditional septic system. Instead of having a complete treatment system for each house consisting of a septic tank and drain field, the communal system consists of each residence having their own septic tank but sharing a community drain field. From each individual septic tank, the effluent is transported by gravity or via pump system to the larger-sized communal secondary treatment tank. After secondary treatment, the effluent can now flow into a combined drain field, which is shared by all homes. This structure is advantageous for three primary reasons.

The first main benefit of this updated structure is that the community can optimally place the drain field. The permeability of the soil in the drain field is key to a properly working onsite wastewater disposal system. The proper permeability of healthy soil allows the removal of contaminants by natural biological, chemical and physical processes that are important for a properly functioning system. The speed with which the effluent travels

Thanks to evolving onsite wastewater demand, new ideas like mass drain fields for community wastewater systems have arisen.

through the soil is very important. If the speed is too fast, microbes in the soil will not be able to properly purify the effluent. If it is too slow, it will cause a “backflow” or backup, which is not only a messy situation but also a biohazard for the homeowner. Having the drain field on an individual property, like in the standard system, could cause issues if the correct soil composition is not available. A communal system is a great solution, since in the planning stages of the subdivision design, the correct location for the drain field can be established and the planner will only design one big drain

field instead of one drain field per residence.

The second benefit of the community drain field is that it allows each property owner more freedom to lay out their property how they desire. No special care must be taken in placing the driveways, sheds, trees or shrubbery for fear of damaging the drain field due to the added weight or root systems. The positive side effect of a communal drain field is that the required size will create a significant green space in the subdivision, which can be used as a recreational park area.

The final primary benefit of the shared system is the shared cost for maintenance. It is hard to pinpoint the exact lifespan of a septic system since multiple factors including maintenance and usage play a role in a properly functioning septic system. According to the EPA, residential septic tanks are typically pumped every three to five years. In addition to the shared cost of maintenance, a community drain field often avoids the need for major repairs. The single residence drain field commonly is damaged by overloading the area due to parked cars on the drain field or other heavy equipment as well as wrongly planted landscaping by the homeowner, which causes root intrusion into the drain field. A community system organized and managed by a neighborhood program or a homeowner association (HOA) can eliminate these issues since the drain field is commonly located where no cars or heavy equipment will have access and landscaping is designed to accommodate the needs of a drain field.

## REGULATIONS DRIVING TECHNOLOGY

Stricter environmental regulations are another driving factor for change in the onsite wastewater sector. For example, Florida’s House Bill 1379, which was approved by Florida Gov. Ron DeSantis on May 30, 2023, stipulates where new construction can’t be connected to a central sewer system, the onsite wastewater treatment system must include an enhanced nutrient reducing system. This bill not only covers onsite wastewater treatment, but also wastewater facilities and requires them to be upgraded to advanced wastewater treatment if the discharge flows into an impaired waterway. New technologies are being introduced at industry specific trade shows to meet these new



## 2023 FLORIDA LEGISLATIVE SESSION HOUSE BILL 1379

This comprehensive environmental protection legislation supports the goals of Executive Order 23-06 (Achieving Even More Now for Florida's Environment), which was signed by Governor DeSantis in January of this year, and builds on our historic investments and accomplishments over the last four years in advancing the protection of our environmental resources.

### STRENGTHENS BASIN MANAGEMENT ACTION PLANS (BMAPs)

LIST OF IDENTIFIED PROJECTS	AGRICULTURAL NONPOINT SOURCES	INCREASED COORDINATION
Requires a list of projects that achieve 5-year implementation milestones and meet Total Maximum Daily Load allocations.	Specific list of regional projects to achieve nutrient reductions established for agricultural nonpoint sources.	Requires DEP to increase coordination with local governments, water management districts and other stakeholders to identify projects.

### ENHANCES INDIAN RIVER LAGOON (IRL) PROTECTIONS

Enhances protections for the IRL by establishing dedicated funding for restoration projects, a comprehensive water quality monitoring program and new requirements and prohibitions on septic systems within the IRL watershed.

<b>\$100 MILLION</b>	<b>JANUARY 1, 2024</b>
Secures \$100 million for water quality projects to benefit the IRL.	Start date for prohibition on the installation of new septic systems (if not previously permitted) where sewer is available.
<b>RESTORATION PLAN UPDATES</b>	<b>JULY 1, 2030</b>
Requires IRL BMAPs to be updated every five years.	Deadline for existing septic systems to connect to central sewer or upgrade to enhanced nutrient-reducing system.

### EXPANDS AND IMPROVES WATER QUALITY PROTECTIONS

Expands and improves water quality protections for areas within a BMAP or Reasonable Assurance Plan (RAP) through more stringent requirements for septic systems and wastewater treatment.

<b>NEW CONSTRUCTION REQUIREMENTS</b>	<b>WASTEWATER FACILITIES UPGRADES</b>
New construction on lots 1 acre or less will be required to connect to central sewer if available, or upgrade to enhanced nutrient-reducing system if unavailable.	By 2033, all wastewater facilities discharging to an impaired waterway must be upgraded to Advanced Wastewater Treatment.

### EXPANDS WASTEWATER GRANT PROGRAM

Expands the eligible projects and project areas.

<b>EXPANDS ELIGIBLE PROJECTS</b>	<b>EXPANDS ELIGIBLE AREAS</b>
Expands eligible projects to include stormwater, agriculture and repairs to aging wastewater treatment facilities.	Expands to include projects to benefit any waters not attaining water quality standards.

### IMPROVES LOCAL GOVERNMENT LONG-TERM COMPREHENSIVE PLANNING

Improves local government long-term comprehensive planning to support environmental restoration.

<b>INCLUSION OF BMAP PROJECTS</b>	<b>SANITARY SEWER</b>	<b>JULY 1, 2024</b>
Requires local governments to include BMAP projects in their comprehensive plans so that these projects can be better prioritized to achieve restoration benefits.	Except for rural areas of opportunity, requires local governments to assess the feasibility of providing sanitary sewer for developments of more than 50 lots, on a 10-year planning horizon.	Deadline for comprehensive plans to be updated with new sanitary sewer requirements.

### EXPEDITES STATE LAND CONSERVATION EFFORTS

Expedites and creates efficiencies for the state's land conservation efforts through the Florida Forever program.

<b>INCREASES THRESHOLD FOR DEP DELEGATION</b>	<b>FLORIDA WILDLIFE CORRIDOR</b>	<b>\$100 MILLION ANNUALLY</b>
Adjusts threshold to \$5 million for land acquisitions requiring approval by the Board of Trustees.	Adds an emphasis on lands within the Florida Wildlife Corridor by including them as a specific public purpose for which the Board of Trustees may acquire land.	Creates dedicated funding of \$100 million annually to fund projects through the Florida Forever program.

FloridaDEP.gov



A community drain field allows each property owner more freedom to lay out their property how they desire.

regulations, and it is exciting to see where all this innovation will lead.

As a result of the new regulations, many septic systems are enhanced with aerobic treatment. An aerobic treatment system relies on oxygen-dependent bacteria to break down organic matter. To achieve a suitable environment for the bacteria, oxygen is introduced using aeration in the tank. This aeration increases and encourages the growth of aerobic bacteria, which thrives in oxygen-rich environments. The treatment chamber usually has some sort of free floating or fixed media in it where the bacteria can attach itself to achieve an optimal distribution of bacteria. These innovations lead to a higher level of purification of the effluent in the water and the ability to meet the stricter environmental regulations. The cleaner effluent reduces demand on the final treatment by microbes





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A properly engineered and designed onsite wastewater system could be a big help in the reduction of potable water waste.

and bacteria. This allows the system to be employed in soils where the ground water is higher as well as in less suitable soils. A more versatile system that doesn't comprise longevity and cost-effectiveness while meeting stricter environmental regulations is a huge advantage for consumers, developers and community health entities.

Secondary treatment also can be achieved using biofiltration systems, which consist of tanks containing a porous filter media such as sand, foam, peat and other materials. This also involves the use of aerobic microbes as they attach themselves to the filter media and are supplied with air through vents in the system. Septic tank effluent is distributed over the filter media, and contaminants are removed by microbial activity and filtration as it trickles down through the media. The treated effluent is collected at the bottom, then sent to a disposal field for final treatment and dispersal.

A properly engineered and designed onsite wastewater system could be a big help in reducing potable water waste. This means not only a reduction of use of fresh water from our ecosystems, but also a reduction of energy needed to transport fresh water via pumps from its place of origin to the place of usage.

### LONGEVITY AND WATER REDUCTION: A SUSTAINABLE SOLUTION

These changes and innovations in onsite wastewater treatment will provide additional opportunities to precast concrete manufacturers. As this type of wastewater treatment continues to gain acceptance, the use will continue to grow. The most important thing precasters can do is to continually strive to improve quality, honing the great characteristics precast is already known for.

Precast concrete structures are durable and long-lasting. Concrete strength and resiliency can withstand environmental factors and natural disasters like rising ground water levels, wildfires and aggressive soil conditions and wastewater characteristics. A precast wastewater structure has a considerably higher density than alternative materials, which will increase stability and resistance to buoyancy in high water table conditions. Another big advantage is the structural capacity of the precast tank. If backfill bedding contains large stones or other large material, these can produce severe point loads that could significantly damage wastewater structures. Precast concrete possesses the strength to better resist these types of loads. These advantages create a more sustainable structure by reducing the need for significant repairs or premature replacement.

Another sustainable attribute can be attained by using advanced purification so that the effluent can be used as non-potable water (grey water). This non-potable water is great for lawn irrigation



and car washes. In our current times with fluctuating climate patterns and an increase in drought conditions, using recycled water is a sustainable solution to reduce the demand on drinking water while keeping a lawn green and a truck clean.

Non-potable water also can be rerouted into the dwelling through separate piping to flush toilets. Toilets commonly use about 31% of fresh drinking water consumption, which can make a tremendous impact on the environment. Consider most modern water-saving toilets are estimated to use about 9.1 gallons per person per day. Assuming a family of four, this would compute to an amount of roughly 40 gallons per day or 14,600 gallons each year. This is equivalent to the daily drinking water for 40 people, according to the medical expert recommendation to drink about 1 gallon of water daily. If you are assuming standard toilets in older homes, this usage could be four times as high.

These are just two examples of how onsite wastewater treatment systems can create a more sustainable future. Improvements and advances in technology as well as the ability to meet new regulations in environmental protection will strengthen the future of onsite wastewater treatment systems. These systems are here to stay!

### KEY TAKEAWAY

What does this mean for the precast industry?

Opportunity abounds. A steadily growing market, innovation to match the trends in regulations and a sustainable product means that precast manufacturers are positioned well to compete in the onsite wastewater market. However, precast manufacturers of wastewater structures must be engaged in the market and see which innovations are coming up to stay ahead of the game while being ready and flexible to adapt to changes.

Think about joining a local onsite wastewater or environmental association, participating at the NPCA Committee Meetings or reach out to NPCA to advocate for your improvement in the standards body, American Society of Testing and Materials (ASTM), or partake in ASTM meetings yourself, to be part in the decision-making process that will shape our industry. The future of onsite wastewater treatment offers lots of opportunities for expansion.



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# Engineering Growth



By Brad Chinery, P.E.

Brad Chinery is vice president of technical services at NPCA.







## The Precast Market is Expected to Grow:

**6.6%**  
by 2027

The precast concrete market is expected to grow 6.6% by 2027. This trend may have you wondering if it's time to expand and invest in your company.

For precast manufacturers, and most manufacturing

businesses, when and what capital investment is needed to continue meeting the mission and vision of the company is of paramount importance – not a decision to be made without due diligence. Comparing alternatives by applying engineering economy is a methodical and structured approach to deciding with confidence.

### WHAT IS ENGINEERING ECONOMY?

Ted Eschenbach in his book, “Engineering Economy: Applying Theory to Practice,” defines engineering economy as “making engineering decisions by balancing expenses and revenues that occur now and in the future.” The methods used to apply engineering economy to problem solving of mutually exclusive alternatives are the Present Worth and Equivalent Annual Worth methods. However, there are some foundational concepts that need to be understood before diving in.

**TIME VALUE OF MONEY** – This is the concept that \$1 today is more valuable than \$1 tomorrow. Applying this concept in practice allows for an honest comparison of expenses and revenues that occur today and at different points in the future.

**INTEREST** – The return on capital. For example, building a new building is the application of capital, and the expected return (through increased revenues) on the application of capital is interest.

**SUNK COST** – Money that has already been spent and is not recoverable in full is a sunk cost. When making decisions we can't go back in time so any analysis should start from now ( $t = 0$ ) and consider the revenues and expenses moving into the future.

**MUTUALLY EXCLUSIVE ALTERNATIVES** – While there are several possible options to choose from, once an option is selected, the rest of the options are no longer viable. For example, you have reorganized your storage yard realizing a half-acre of open land. If you choose to expand the office, you can no longer use that space for a warehouse. Alternatively, if you choose to expand your production facility into that space, you cannot then choose to use that space for a new batch plant.

**MAINTAINING THE STATUS QUO** – An often-overlooked option when considering what action to take is the option of doing nothing. This may not always be an option, but it should always be considered.

### THE SITUATION

There just isn't enough space!

There are many reasons why precast manufacturers need additional production space. It may be volume and the need to keep up with demand. It may be an opportunity in the market for a new product (precast building, storm shelter, bunker silo, or a custom product) and that product requires a higher/bigger crane system (increased headroom and/or increased capacity). It may be a change in the policy made by the authority with jurisdiction. Whatever the reason, more production space is needed.

Finding available land may require an extensive reorganization in the storage yard or finding a concrete recycling company to get rid of the on the back forty that did not meet quality standards. It could involve establishing creative partnerships to donate products as starters for new coral reefs or for use by local firefighters for training. For some, it may require leasing or purchasing additional land. For this example, it is assumed that there is available land within the company's existing footprint.

### THE PROBLEM

How should the available land be used to expand production space most economically?

### THIS ANALYSIS WILL CONSIDER THREE ALTERNATIVES:

- ▶ New production building with integrated crane
- ▶ New outdoor space with new straddle crane
- ▶ Maintain the status quo (do nothing)

The simplified expenses and estimated revenues for each alternative is shown in Table 1 below. Note, this is a simplified example not accounting for inflation and other variable economic factors that may be considered.

		NEW BUILDING	OUTDOOR SPACE & STRADDLE CRANE	STATUS QUO
EXPENSE	Initial Capital Expense	\$500K	\$225K	\$0
	Ongoing Maintenance	\$5K/YR	\$10K/YR	\$0
REVENUE	Additional Volume / New Product	\$125K/YR	\$100K/YR	\$0

Table 1

As you can see the capital expenses are the highest for the new building while the ongoing maintenance costs are the highest for the outdoor production slab. Both new production space options yield a return on the investment from increased capacity or new market offerings. Conversely, the option to maintain the status quo does not have any capital costs nor does it have potential revenues.

In an economic analysis it is critical to understand the sign convention for the revenue and expenses analyzed. Methods seeking to minimize cost will frequently assess costs as positive and revenue as negative. However, the methods used in this discussion, Present Worth and the Equivalent Annual Worth, both assess revenue (money coming in) as positive while expenses (money going out) are negative.

### THE PRESENT WORTH METHOD

The Present Worth Method seeks to bring all future expenses and revenues back to the present for comparison. To complete this analysis, the evaluation period, lifespan and interest rate (discount rate) must be defined. Cash flows occur at the end of each period except for initial costs. For each option this analysis will include 10-year and 50-year lifespans at an interest rate of 6% and annual



evaluation periods. The initial costs are already in the present (t=0); however, the ongoing costs and revenues are annuities that need to be converted to a single value at t=0. The following equation applies:

$$A * \frac{(1 + i)^N - 1}{i(1 + i)^N}$$

Where A is the annuity amount, i is the interest rate, and N is the number of evaluation periods. The factor to bring an annuity into the present worth for i=6% and N=10 years is 7.360 and the factor for i=6% and N=50 years is 15.762.

#### New Building

The present worth calculations (in thousands) for the new building are:

$$PW_{New\ Building, 10\ years} = -\$500 - (\$5 * 7.360) + (\$125 * 7.360) = \$383.2$$

$$PW_{New\ Building, 50\ years} = -\$500 - (\$5 * 15.762) + (\$125 * 15.762) = \$1,391.44$$

The positive present worth means there is a positive return on investment (ROI). As shown in the graph below, the new building option will yield a positive ROI in the fifth year.

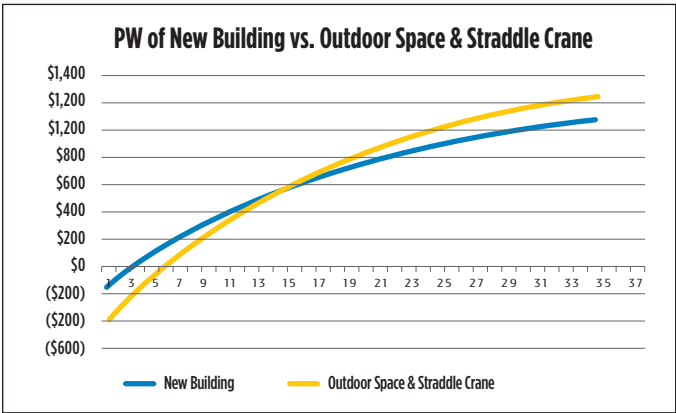
#### New Outdoor Space

The present worth calculations (in thousands) for the new outdoor space & straddle crane are:

$$PW_{Outdoor\ w/\ Crane, 10\ years} = -\$225 - (\$10 * 7.360) + (\$100 * 7.360) = \$437.4$$

$$PW_{Outdoor\ w/\ Crane, 50\ years} = -\$225 - (\$10 * 15.762) + (\$100 * 15.762) = \$1,193.58$$

The new outdoor space will yield a positive ROI in the third year and is the optimal choice given a lifespan of up to 13 years. For any lifespan after 13 years the optimal choice is the new building option.



### EQUIVALENT ANNUAL WORTH METHOD

While the present worth method brings all expenses and revenues to time t=0 for comparison this analysis does have some limitations. When comparing alternatives, they usually must have the same lifespan; otherwise, one of the options will have a gap in service. When assessing alternatives with differing lifespans the equivalent annual worth method may be the best approach (although with some additional math the present worth method can still be used). In the equivalent annual worth method, all



expenses and revenues are converted to a uniform annual worth. The method is also generally understood because example results are “this project will yield \$250k annually” or “option 1 will save \$3500 annually compared to option 2.”

The same requirements apply for the equivalent annual worth method as the present worth method. The evaluation period, lifespan and interest rate (discount rate) must be defined. Cash flows occur at the end of each period except for initial costs. For each option this analysis will include 10-year and 50-year lifespans both at an interest rate of 6% and annual evaluation periods.

Evaluation periods are not required to be annual; however, the interest rate is typically assessed as an annual interest rate. If the evaluation period is changed, the interest rate has to be adjusted appropriately for the evaluation period. For example, an annual interest rate assessed with a quarterly evaluation period will require the interest rate to be divided by 4 to make it a quarterly interest rate. ( $\frac{6\%}{4} = 1.5\%$ )

In this method the annuitized expenses and revenues do not need conversion while the initial costs need to be converted using the following equation:

$$P * \frac{i(1+i)^N}{(1+i)^N - 1}$$

Where P is the present value, i is the interest rate, and N is the number of evaluation periods. The factor to convert present worth into an annuity for i=6% and N=10 years is 0.1359 and the factor for i=6% and N=50 years is 0.0634.

### New Building

The present worth calculations (in thousands) for the new building are:

$$EAW_{New\ Building, 10\ years} = -(\$500 * 0.1359) - \$5 + \$125 = \$52.07$$

$$EAW_{New\ Building, 50\ years} = -(\$500 * 0.0634) - \$5 + \$125 = \$88.28$$

The positive values show a positive ROI. At a 10-year lifespan the new building, given the assumptions, will yield \$52,070 annually in increased revenue. At a 50-year lifespan, the new building will yield \$88,280 in additional revenue compared to the status quo.

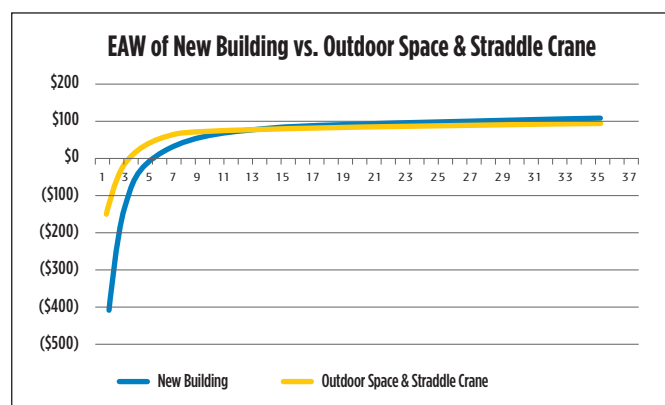
### New Outdoor Space

The equivalent annual worth calculations (in thousands) for the new outdoor space & straddle crane are:

$$EAW_{Outdoor\ w/\ Crane, 10\ years} = -(\$225 * 0.1359) - \$10 + \$100 = \$59.43$$

$$EAW_{Outdoor\ w/\ Crane, 50\ years} = -(\$225 * 0.0634) - \$10 + \$100 = \$75.73$$

Again, the outdoor space & straddle crane option is optimal at the 10-year lifespan yielding an additional \$7,360 in revenue annually. However, over a 50-year lifespan the new building produces an additional \$12,550 in annual revenue. The numbers are presented differently that in the Present Worth method yet, the results are the same. Furthermore, the results can be converted from an annuity to present worth using the equations shown as part of the Present Worth method. While the graph looks different the breakeven points and the point at which the new building becomes more optimal remain the same.



### STATUS QUO

Maintaining the status quo may or may not be an option when considering alternatives, but it should always be included in the initial consideration. In the scenario, the present worth is \$0 and the equivalent annual worth is also \$0. This is because there are no expenses or revenues associated with doing nothing. However, if you consider the opportunity cost, choosing the status quo option is to lose from \$52,070 to \$88,280 in annual revenue depending on the comparison option. In this scenario, doing something is better than doing nothing.

Conversely, doing nothing now allows for a manufacturer to pursue an opportunity later that may not be apparent in the present without the sunk cost of a new equipment that may or may not be optimal. Unfortunately, we do not know the future so every decision, no matter how well analyzed, is based on assumptions and comes with risk.

### CONCLUSION

Due diligence is necessary for any big decision, and there are myriad tools available for decision making including sensitivity analysis, probability theory and multi-objective techniques. Each of these tools will help navigate through the growing pains to better capture the risk and uncertainty associated with assumptions. However, the magnitude of the decision and the time available will influence if any of these should be used. An engineering economy analysis may help provide additional clarity on the optimal option.

# Here We Grow Again

Congratulations  
to the NPCA  
**MASTER  
PRECASTER**  
Class of 2024

## MASTER PRECASTER PROGRAM CELEBRATES ANOTHER RECORD CLASS



By Heather Bremer

Heather Bremer is the  
director of communications  
at NPCA.

As general manager at M-1 Tanks, Joshua Wahl wears a lot of hats.

It's a small company with only 12 employees. So, whether it's quality control, safety or finding buoyancy calculations, Wahl has a hat to do the job.

In February at The Precast Show, Wahl added another hat to his collection.

He was one of a record 76 Master Precaster graduates to be honored during the Keynote Luncheon on the opening day of the Show. In addition to a certificate, the newly anointed Master Precasters receive a highly coveted gold hard hat. It's a memento Wahl is excited to have in his office.

"I'm proud to show it off," Wahl said. "And I'm really proud of my crew for helping me free up enough time to actually be able to achieve this. It's really been a great experience."

Since its inception in 2012, 433 men and women have received the Master Precaster designation. The

program began with one graduate in its first class, with numbers steadily climbing each year. In the past two years, the graduate count has jumped to record heights and is only expected to grow.

The rapid growth is significant because the title of Master Precaster is no easy thing to achieve.

### THE PATH TO MASTER PRECASTER

The Master Precaster Program is part of NPCA's Precast University. This precast-specific training curriculum through NPCA's Production & Quality School includes comprehensive education courses on production, safety, technical, quality control and leadership. It can be completed by taking six courses online and in person.

"It's been built on the needs of the members," said Wilbert Precast's Brandy Rinkel, Chair of NPCA's Education Committee. "It's designed specifically for their employees."



MASTER PRECASTER CLASS OF 2024

NPCA FILE PHOTO



The program typically takes at least two years to complete. The rigorous schedule provides some flexibility with online courses.

“Every day (at work) is putting out fires,” Wahl said. “So having to sit down and focus for hours during the work day was doable for the (webinars and in-person classes). But having the ones I can do at my own pace was really helpful.”

A hopeful Master Precaster’s path begins with PQS I, now offered online. The course covers the basic body of knowledge that all employees at a precast concrete plant should have. Veterans of the precast concrete industry, including the late Mel Marshall, developed the comprehensive program to address the key fundamentals of producing quality precast concrete. It covers each critical step of the production process from start to finish, including batching and mixing, reinforcement, production practices and quality control.

The next step requires participants to complete the PQS II – Safety: Precast Module and have a valid OSHA card. PQS II – Safety examines safety issues associated with the precast production process. Upon completion of the course, participants are able to identify safety hazards, apply techniques and implement programs to improve safety, lead toolbox talks and develop action plans to address concerns.

PQS II – Production is the first of the required courses to be offered in person. It is held annually for two days ahead of The Precast Show. This year’s class drew a record number of participants, with 112 men and women in the class.

The Production course is designed for plant personnel who will benefit from a comprehensive understanding of precast-specific production practices. It goes beyond the fundamentals explored in PQS I to prepare students to become production leaders in their plants. Topics include concrete lean manufacturing, repair procedures and techniques, reinforcement, and lifting and handling. Participants are engaged in hands-on learning that challenges their knowledge and teamwork skills.

The next course, PQS II – Technical is offered annually as a webinar. Utilizing NPCA’s engineers and other industry experts, Technical explores the technical aspects of the manufactured concrete production process. The course focuses on basic mechanics, the basics of design theory for concrete elements, proper lifting of products, reading and understanding blueprints, and standards and specifications.

A math prep course is required to complete the five-day course.

PQS II – QA/QC rounds out the Level 2 courses. Offered online, the course stresses the importance of a well-executed QA/QC program to a successful precast operation. It covers aggregate gradation analysis, aggregate moistures and hot- and cold-temperature concrete. Participants learn why the water-to-cement ratio is so critical to concrete properties and the need for frequent



More than 600 people gathered to honor the Master Precasters during the Keynote Luncheon at The Precast Show.

testing to assess water absorption and movement in concrete.

The final course to secure your Master Precaster title is PQS III – Leadership. PQS III will help you reach the next stage of your career, whether you are looking to hone your leadership skills or expand your career opportunities. The course explores current leadership principles to strengthen your management styles and skills with traditional and cross-cultural workforces.

The course is offered annually leading up to The Precast Show. This year, the class also had a record number of participants at 64.

## BENEFITS FOR EVERYONE

While some might see the Master Precaster program as intended for those just starting out in the industry, it’s designed for everyone, from someone in their first year at a precast facility to those with years of experience looking to move into a new, more challenging role.

“Being raised in precast my whole life, I thought I knew everything about precast,” said Allen Lee of Lee’s Precast Concrete. “So, I started that program, and I learned a lot. All different aspects of what we do every day is covered in that program.”

Wahl spent a lot of late nights finishing the online courses and taking tests to pass the classes. But those long hours are worth it to have that gold hard hat and be equipped with the tools to keep wearing those other hats.

“Going through PQS has given me those tools, these reference points,” Wahl said. “It’s given me the time to kind of hone in and focus on these skills. It’s really helped me in talking to specifiers, engineers, designers and contractors on site. And it’s challenged me to do a better job working with my crew.”

Visit [precast.org/master-precaster](https://precast.org/master-precaster) to learn more.

► View Individual Master Precaster Graduates on Pages 30 & 32





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# Responding to OSHA Inspections & Violations

**PROACTIVE PLANNING, A STRONG SAFETY CULTURE AND WELL-DOCUMENTED PROCEDURES ARE ALL KEY TO RESPONDING TO SAFETY INCIDENTS AT YOUR PRECAST PLANT.**



**By Mason Nichols, M.A.**

Mason Nichols is a Grand Rapids, Mich.-based writer and editor who has covered the precast concrete industry for more than a decade.

Precast concrete plants produce incredible structures. From the smallest blocks to the largest bridges, seemingly no project is out of the question. Thanks to the ingenuity of the workforce, along with ever-advancing machinery and concrete technology, the industry is constantly evolving, generating projects that are structurally complex, aesthetically pleasing and capable of lasting long into the future.

Despite these advances in manufacturing, safety remains a primary focus for the precast industry. With heavy machinery in operation and large products on the move, the potential for accidents necessitates robust safety plans aimed at protecting employees from the many hazards that exist inside plants.

Accidents and injuries can never be eliminated completely. As such, leadership groups and safety teams across the U.S. and Canada must be adequately prepared to respond to possible inspections, violations and citations from OSHA or the Ministry of Labor. The best defense in these situations is establishing a strong safety culture that is anchored by training programs, open lines of communication, auditing processes and strong documentation.

## **ESTABLISHING A STRONG SAFETY CULTURE**

Preparing for an inspection or investigation begins long before the accident ever takes place. As Thomas Jimeno, occupational safety and health manager at Wilbert Precast of Spokane, Wash., explained, it's all about developing a safety approach that is enhanced through time.

"With your safety program, you never have one that's complete," he said. "It's always evolving and will only be as strong as you are actively engaging with it and making it available to your employees."

Promoting and sustaining a strong safety culture is a constant process that requires buy-in from the leadership level all the way down through the rest of the plant. Ensure open lines of communication exist between all teams, and encourage workers to report issues they see while conducting operations.

"You must foster a workplace environment where employees will come forward to talk about safety concerns and incidents, whether it's mistakes they've made or noticed in the workplace," said Marlo Harley, MBA, manager of environmental health and safety at Ontario, Canada-based DECAST. "They need to know that their opinion and voice counts. We cannot solve safety issues here without worker participation."

Beyond open lines of communication, plants also should consider establishing a safety committee that can focus on site-specific elements of need. Such committees should include team members from across the company.

"Safety committees are extremely important," Jimeno said. "They are the ones who see what's going on. Here, I've got guys from pretty much every



**IN THE U.S., SHOULD A SUSTAINED INJURY RESULT IN A HOSPITALIZATION, AMPUTATION, LOSS OF AN EYE OR DEATH, EMPLOYERS ARE REQUIRED TO NOTIFY OSHA.**





department on my committees. They help maintain the culture and assist with the enforcement of the program.”

Training programs are another key part of the recipe for a strong safety culture. Evaluate your plant, considering the types of products you manufacture as well as the machinery used, and develop appropriate safety training around your specific situation. These programs can prove extremely effective in not only mitigating accidents and injuries, but also in how you respond to a governing body like OSHA when an inspection takes place.

Document all the steps you take as you create and refine your safety program, including when incidents occur and how you respond to them, what new training you have offered and anything else related to preparing your employees for the many different situations they may experience when working in your plant. Such documentation will prove instrumental should an inspection or violation occur.

### AUDITING FOR SUCCESS

In addition to developing a strong safety culture, consider working with your local or regional labor department to engage in consultations. These will help you identify areas of strength and any deficiencies you may have pertaining to safety in your plant. This process will help pinpoint weaknesses while also allowing you a chance to address issues without the risk of incurring a violation. In Washington, Jimeno works with the Washington

**“You must foster a workplace environment where employees will come forward to talk about safety concerns and violations, whether it’s mistakes they’ve made or noticed in the workplace.”**

– Marlo Harley, DECAST





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### **FATALITIES MUST BE REPORTED TO OSHA WITHIN EIGHT HOURS, WHILE THE OTHER SIGNIFICANT INJURIES MUST BE REPORTED WITHIN 24 HOURS.**

State Department of Labor & Industries (L&I) throughout the year to make this happen.

“I have L&I come into my three plants every year for this,” he said. “They go through our safety program and processes. Then, they let us know what we are missing along with any improvements or changes we need to make.”

Chad Meyers, operations manager for Kansas City, Kan.-based precaster PRETECH Corp., follows a similar approach with the Kansas Department of Labor (KDOL).

“We perform our own self-audit alongside KDOL every year,” he said. “They send a representative out to the plant, and we go through all the buildings – if they see any violations, they will let us know. And, because they are so well-versed with OSHA rules, they can address any questions we have as we seek to improve.”

Engaging with these organizations opens a line of communication that shows good faith in your efforts and allows your plant to identify and correct potential safety concerns before



they become major issues.

At DECAST, Harley and her team recently worked to achieve ISO 45001 certification. ISO 45001 is an internationally recognized standard that provides a framework for organizations to manage risks and enhance occupational health and safety performance. Obtaining the certification adds another layer of protection for



employees that goes beyond DECAST's interactions with the Ontario Ministry of Labor.

"For us, going through an audit certification process like ISO has been very helpful," Harley said. "Engaging in any audit process, whether internal or external, is a smart way for a team to evaluate how well they are performing against legislation. It's really a way for you to benchmark your program around successful ones."

### AN ACCIDENT OCCURS. WHAT'S NEXT?

Despite best efforts, safety incidents at precast concrete plants are a reality of working in the industry. Once an accident takes place, the due diligence you have performed in setting up and establishing your safety program and culture will play a key role in what happens next, but it's imperative to respond appropriately.

First, address the employee in question. Depending on the severity of the injury, decide what medical services may be needed, such as a visit to urgent care or the emergency room. Once the affected employee is taken care of, fill out an injury incident report. Typically, this report will include information such as the type of injury sustained, how the accident happened, what bystanders witnessed and more.

At Wilbert Precast, Jimeno said his team looks at the process being used during the incident, any equipment involved and whether the affected employee was using the correct training. Utilizing the incident report as a guide, you can refine your safety program and training efforts to put your employees in a better spot to succeed moving forward.

In the U.S., should a sustained injury result in a hospitalization, amputation, loss of an eye or death, employers are required to notify OSHA. Fatalities must be reported within eight hours, while the other significant injuries must be reported within 24 hours. In Canada, rules for reporting vary by location and are governed by each province's Ministry of Labor. However, in most cases, significant injuries and deaths should be reported as quickly as possible.

Typically, after the incident is reported, you will be asked to provide documentation of what took place – this includes the injury report filed, your accident prevention plan, OSHA 300 logs (in the U.S.) and anything that is pertinent to what occurred. If the accident involves equipment, your governing body will also want to see any training programs offered or certifications held in relation to that equipment.

"In the end, it's all your preparation in the beginning that will determine how well your investigation goes," Jimeno said. "Everything with an OSHA violation really stems from if you do the work up front and have all your documentation to show that you did everything you could to train and protect your employees, things will go very well."

Should an investigation result in a violation, precast plants in both the U.S. and



**"99% of the work in a successful investigation is done before OSHA ever shows up."**

– Thomas Jimeno, Wilbert Precast

Canada retain rights to dispute the decision. In the U.S., companies have 15 working days from the date the citation is received to contest, in writing, the citation, proposed penalty or abatement date. OSHA encourages those considering an appeal to speak with an area director to discuss options for addressing the issue. If the appeal is not contested within 15 working days, the citation becomes a final order and is not subject to review by any court or agency.<sup>1</sup> While the situation varies by province across Canada, in Ontario, companies who dispute a Ministry of Labor decision can complete an Application for Review that sets out the facts and reasons for the application within 30 days of the citation's issuance.<sup>2</sup>

### PREPARATION IS KEY

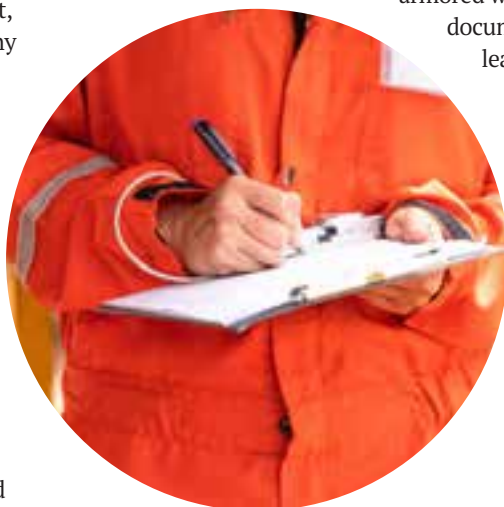
The best way to bolster your defenses against safety incidents and potential citations is to establish a strong safety culture armored with robust training programs, sound documentation and open communication from leadership to the plant floor. While incidents cannot be completely avoided, they can be mitigated, which will minimize the potential for serious retributions resulting from accidents. As Jimeno hammered home, it's all about preparation.

"99% of the work in a successful investigation is done before OSHA ever shows up," he said.

#### REFERENCES:

1 <https://www.osha.gov/sites/default/files/publications/osha3000.pdf>

2 <https://www.ontario.ca/document/your-guide-employment-standards-act-0/role-ministry#section-11>



# Standing On Tradition

**FAMILY-OWNED BUSINESS STILL GOING STRONG AFTER SUPPLYING TANKS FOR FLORIDA'S WASTEWATER INDUSTRY FOR MORE THAN 60 YEARS.**



**By Shari Held**

Shari Held is an Indianapolis-based freelance writer who has covered the construction industry for more than 10 years.

In 1965, Treston E. Vause and his wife, Dulcie Vause, founded a ready-mix concrete plant in Hawthorne, Fla. Things went well until the mid-70s when it became difficult to obtain raw cement. Undaunted, Treston Vause converted the plant into a precast facility and began manufacturing precast septic tanks.

To address the challenges of the industry and provide input into regulatory discussions, Treston Vause, along with nine others, was a founding member of the Florida Septic Tank Association, now known as the Florida Onsite Wastewater Association (FOWA). Today, his daughters, Susan Allen, president of Florida Septic, and Ellen Vause, vice president of operations, continue to participate. Ellen Vause previously served as president of the organization, and Allen currently serves on its board of directors.

Allen recalled her father came up with the idea to donate \$1 to the association for every association member who purchased tanks from Florida Septic. His savvy marketing strategy paid off, and Florida Septic expanded its reach from a local supplier to a statewide supplier.

Treston Vause also began the practice of purchasing raw materials from only American vendors, a practice Florida Septic continues today.

From the beginning, Florida Septic was a true family business with everyone pitching in. Treston Vause managed the plant, and Dulcie Vause handled the bookkeeping. Their three daughters — Ellen, Susan and Nancy — learned the business first-hand by helping part-time during high school and

beyond. Treston Vause instilled them with his values of ethics, integrity, workmanship and customer service.

The company experienced continual growth, and in 1984 Treston Vause built a new, updated facility. In 1987, the company was still small — only 20-some employees — and mainly sold small septic tanks for the residential market. Treston Vause had big plans for expanding the company's product line, but they were cut short when he died of a heart attack in 1987.

## FACING CHALLENGES

At the time of Treston Vause's death, his daughters were only in their 20s. The big question was: Should the family sell the business or carry on? Treston had been a wonderful mentor, training Ellen Vause to become his "right-hand person." Ultimately, the family felt they were prepared and opted to stay the course. Ellen became president, Susan, vice president, and Dulcie, secretary-treasurer. Nancy filled in wherever she was needed.

"It's been a good livelihood for the 40 years that he's been gone," Ellen Vause said. "We did the same things we'd always done. Doing it like he had wanted it done. We just graduated from being part of the process to being the process."

Florida Septic experienced continual growth, and, by 2006, it employed 88 employees and produced







Florida Septic employs 50 people and considers each one family.

**“It’s been a good livelihood for the 40 years that he’s been gone. We did the same things we’d always done. Doing it like he had wanted it done.”**

– Ellen Vause, Florida Septic

tanks with a capacity of up to 5,000 gallons. Things were looking up.

Then, the Great Recession of 2007 to 2009 hit. The economy crashed. Companies went out of business. Millions of workers lost their jobs. Florida Septic weathered the storm but went from 88 employees to 25.

Allen will never forget 2009. She faced two major challenges that year. For one, she assumed the role of president when Ellen Vause left to pursue another path. Dulcie became vice president and Andrew Palmer, Allen’s son, took over as secretary-treasurer.

In the aftermath of the Great Recession, the economy was still shaky



and businesses continued to struggle.

"I had to rebuild the whole company and bring it back up from the bottom-out of the housing industry," Allen said. "I went back in the trenches and got it going again. We rode it out, then brought it back up. And here we are today."

Her second challenge was personal. She used the same determination and grit that helped her rebuild the plant to successfully battle cancer.

## BALANCING PROFESSIONALISM WITH A FAMILY FEEL

Florida Septic now employs about 50 people. And every one of them is considered part of the family.

"The thing I'm most proud of is keeping the family atmosphere with a professional business and still putting out the quality and service we've always had," Allen said.

Quality Control Manager Keith Maynard, 51, was working for another precast company when he applied at Florida Septic in 2006. It was the company's family orientation that attracted him and keeps him there.

"Two or three guys have been here over 30 years, and a bunch of guys have been here 20-plus years," Maynard said. "That should tell you the kind of company Florida Septic is — how they are and how they treat their employees."

As far as working with Allen and Ellen Vause, he appreciates that each one has a different perspective.

"Susan's very financial oriented and knows the business side very well, while Ellen looks at things from the production end of it," Maynard said. "They work together so you get both perspectives."

And that leads to a quality product.

"I challenge anyone in the state to have a stronger, more durable tank than what we produce," Maynard said.

Donald Crosby, 69, started with the company in 1976 when he was 21. His experience with the company spans many different

jobs, and he goes wherever he's needed throughout the day.

Why has he stayed at Florida Septic for 48 years?

"Excellent co-workers, excellent management and a love of the industry," Crosby said.

Crosby affirmed that the company's core values and goals have remained the same — "just like Mr. Vause intended," while it has advanced to take advantage of new technologies.

"You're going to have to look extremely hard to find a company that's better than Florida Septic," Crosby said. "I really believe that. It's knowledgeable. It's got experience. And it enjoys helping people."

Helping others also hearkens back to those core values.

"We keep a good, open rapport with everybody and do the right thing," Allen said. "Quality. Service. Customer. We do our best."

## KEEPING UP WITH THE TIMES

Ellen Vause became active with NPCA while she was president, and Allen carries on that tradition. Anything that can make the plant more productive, more efficient or more profitable is a plus in their estimation.

"NPCA is where I learn things that help the company become a better manufacturer," Allen said. "We like to be proactive in everything. If we stay on top of it, we don't have to catch up with it later."

She especially appreciates the videos on lean manufacturing and the connections she and Ellen have built over the years among other members and vendors.

Ellen Vause, who served on the NPCA Onsite Wastewater Committee for many years, returned to the company in 2022. She oversees the company's general operations plus keeps an eye on wastewater trends and attends state and local regulatory meetings.

"In Florida, we're heavily regulated on on-site wastewater systems," Ellen Vause said. "We have to stay up on all the current regulations and upcoming ASTM changes, so we don't get caught with product we can't sell because the regulation has changed. It takes a while to modify your forms and your mix."

Florida Septic maintains an inventory of about 1,100 tanks for quicker delivery.





## ROLLING WITH THE TIMES

Over the years, Allen tweaked the business to keep it on track. In 2015, she shut down its installation business to concentrate on expanding manufacturing.

One thing the company hasn't tweaked is its focus on customer service. For example, Florida Septic not only delivers septic tanks on-site but also sets them, so the customer doesn't have to hire a crane.

"Some of these tanks weigh 30,000 pounds," Allen said. "We're all about quality and service to our customers. That's what has kept us going for a very long time."

The company also maintains an inventory of approximately 1,100 tanks so customers can get quicker delivery.

Florida Septic has supplied the state of Florida with hundreds of thousands of septic tanks over the years.

"I don't think there's any individual project that stands out," Ellen Vause said. "It's just a process of serving the industry and having the precast that they need to do their work."

Here are a couple examples:

- ▶ Florida Septic supplied five 3,000-gallon tanks and five 2,000-gallon tanks for the Madison RV and Golf Resort in Madison, Fla.
- ▶ The company supplied Lakeland Septic Company with 1,500-, 3,000- and 3,300-gallon tanks for a new septic system for a farm worker housing project in Plant City.
- ▶ Florida Septic supplied a 1,500-gallon tank to Welland Plumbing for a Winn Dixie in Gainesville, Fla. The tank weighs 16,515 pounds by itself and 22,998 pounds with the lid.

## MODERNIZING FOR GROWTH

Forty years after their father built a new precast plant, it's received another update. Recently, Florida Septic purchased a customized Manufacturing Critical-Path Time (MCT) plant optimization package and integrated the new equipment with its existing equipment. The package includes the latest technology for dosing and conveying materials from existing bins and silos and a 4-yard automated mixer. The concrete hopper holds batches for proportioning in the molds, freeing the mixer to prepare another batch, which facilitates concrete pouring.

"We pour about 80 yards a day in our forms," Vause said. "That equates to about 10,000 tanks per year, not including the pieces for the lids, the risers and other products."

The new plant has been operational since November 2023.

"We went from six hours to fill forms down to three-and-a-half hours," Allen said. "We're doing the job in half the time."

Other new equipment includes a 65-ton knuckle boom crane mounted on a Dorsey Tri-Axle drop deck trailer from Irving Equipment in Tifton, Ohio, and a new forklift from Forklift Exchange, headquartered in Fort Myers, Fla. Both are NPCA members.

"I've had really good luck with the vendors at NPCA's trade shows," Allen said. "NPCA's been a real help."

Florida Septic is always on a quest for improvement. Currently, it's undergoing tank and vacuum testing on certain products to see if fiber might be an acceptable substitute for steel rebar.

"Everything in the precast industry that's new, we try," Ellen

**"We're all about quality and service to our customers. That's what has kept us going for a very long time."**

– Susan Allen, Florida Septic

Vause said. "We're always doing a little side experiment on something to try to do better."

## LOOKING AHEAD

The next step is to get the plant DOT-certified. Allen wants to diversify Florida Septic's product line to include manholes and other DOT-approved products. She's currently investigating the best products to add.

As for the future, she hopes her son, Andrew, will take over one day. Ellen's grandson Jackson may join the company, as well. But if they take other paths, the company is still covered.

"We have three directors, heading different divisions of the company," Allen said. "They can keep the company going while Ellen and I can be consultants."





# Challenge Accepted!



By Bridget McCrea

Bridget McCrea is a freelance writer who covers manufacturing, industry and technology. She is a winner of the Florida Magazine Association's Gold Award for best trade-technical feature statewide.

## PRECAST IDEAL CHOICE TO COMBAT WINTER CONDITIONS, TIGHT TOLERANCES AND A SET SCHEDULE FOR A NEW BEHAVIORAL HEALTH CENTER PROJECT IN COLORADO.

When the Vail Health Foundation broke ground on its new, 50,000-square-foot inpatient behavioral health facility in Edwards, Colo., the plans were already in place for a precast concrete stormwater management system. That's because the project engineer knew well in advance that there wasn't room or time to build a cast-in-place structure onsite, and his firm was already familiar with Oldcastle Infrastructure's StormCapture® system.

Designed to capture and treat stormwater runoff, StormCapture promotes environmental stewardship and mitigates the impact of urban development on water resources. Andrew Verratti, P.E., project engineer with Martin/Martin Consulting Engineers in Lakewood, Colo., said space on the site was limited by a railroad on one side, an interstate

highway on another and "limited usable land" on a third side.

"We didn't really have an opportunity to use traditional above-ground retention ponds. We needed some below-grade structures," said Verratti, who also had to factor in elevation challenges, the need to discharge on property and some grading issues.

The stormwater structure also had to be HS-20 load rated so that fire trucks and heavy construction equipment could travel over it.

"It needed to be durable and able to withstand that extra loading," Verratti said.

Martin/Martin had used Oldcastle's StormCapture system successfully on other projects. An underground, modular, precast concrete storage



**“We didn’t really have an opportunity to use traditional above-ground retention ponds. We needed some below-grade structures.”**

– Andrew Verratti, P.E., Martin/Martin Consulting Engineers

system, StormCapture is used for stormwater infiltration, retention, detention and water quality treatment. The cost-effective solution is particularly good for sites where stormwater must be managed and controlled. Verratti said he also liked the ease of cleaning the system via manhole covers.

“We’ve run into issues with other types of structures,” Verratti said. “Those issues were solvable, of course, but for this application we found it was best for someone to be able to drive a pump truck up and vacuum or jet it out.”

Martin/Martin designed the structure to be “long and skinny” to accommodate good retention and routing of the flows. As a finishing touch, it added a customized bay on one unit. That bay serves as an outlet structure and incorporates a weir, water quality sensor and orifice place.

“It was pretty customizable,” Verratti said. “Oldcastle was pretty accommodating in helping us design this.”

## A CRITICAL MILESTONE

On track to open for business in the spring of 2025, the Vail Precourt Healing Center will provide adolescents and adults with access to quality inpatient behavioral health close to home. Previously, individuals in crisis had to travel two hours to either Grand Junction or Denver to access this type of care. The three-story building will offer 24-hour behavioral health care serving adults and adolescents in crisis (ages 12 and above), 28 total beds for short-term stays and treatment, and structured behavioral health services that prioritize crisis resolution, safety and stabilization.

“The Precourt Healing Center will be a critical milestone in continuing our mission to elevate health across our mountain communities and is crucial in our battle against the behavioral health crisis in the state and our valley,” Chris Lindley, EVBH executive director and Vail Health chief population health officer, said in a press release.

The general contractor on the project was Haselden Construction of Centennial, Colo., and Johnson Construction, Inc., of Rifle, Colo., handled the excavation and installation. For the project, Oldcastle Infrastructure manufactured 13 StormCapture modules, each of which was 4 feet high. It also made five link and grade slabs that make up the center of the system.

“This helped create a cost savings because we eliminated the need to do a full concrete module,” said Maddi Snyder, stormwater consultant at Oldcastle Infrastructure. “When we have systems that are larger than two rows — and this one had three rows — we’re able to use that link slab configuration.”



Oldcastle Infrastructure manufactured 13 modules, each of which was 4 feet high.

Snyder said Oldcastle got involved with the project in May 2022, when the general contractor was looking for an underground detention system to manage all of the stormwater runoff for the new facility. Working with Martin/Martin, the precaster’s design engineers developed a system that would meet the project’s storage volume requirements within a limited physical footprint.

The system is HS-20 traffic rated and uses native soils for backfill, thus eliminating the need for a specific aggregate to be brought in.

“Because we don’t rely on that backfill aggregate for storage, it helps reduce the installation costs,” Snyder said.

The system is also environmentally friendly in that it incorporates

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**“Logistically, in terms of mountain concrete availability, we have a high level of difficulty getting a lot of concrete quickly just because there’s a very limited supply. Because of this, precast is always a good option.”**

– Tasha Haselden, Haselden Construction

native soil versus introducing outside aggregates into the environment.

### MANAGING THE CHALLENGES

Snyder says the project was fairly straightforward from the precaster’s perspective, although a few project delays meant the final installation was going to happen in the middle of the cold Colorado winter. Johnson Construction was called upon to handle the excavating and utility work for the underground detention system. Rob Bercher, vice president at Johnson Construction, said the limited site space and snow created some challenges at that point.

“The site was pretty tight. It took a little finagling to figure out and we had to size our crane appropriately to get the reach because we could only set the crane in one spot,” Bercher said. “Weather also plays a big role here in February; we were worried about stacking trucks up and not getting them set in a timely manner or having them stuck on the roads.”

Luck was on the project team’s side, and the whole system was installed within two days – 20 pieces on Day 1 and the remaining 17 the following day.

“We lucked out and had a couple of good days to work with,” Bercher said. “Once we got the pre-planning done, the pad set and the grading finishing, [the system] just kind of went together like big LEGOs.”

Tasha Haselden, project manager at Haselden Construction, said the stormwater system was a good fit for the site, logistics and weather conditions on this particular project.

“From a trucking, logistics and pre-planning perspective, it was somewhat challenging because doing work in the wintertime means roads can get shut

down,” she said. “It just takes a lot of communication, coordination and pre-planning to ensure everything’s delivered and installed on time.”

### THE PERFECT FIT

Haselden said the general contractor, installer and precaster all worked well together to ensure a successful project and fast installation time of just two days.

“That was a pretty big feat considering snow, weather and having to set the system in the winter,” she added.

Like Verratti, Haselden said precast was selected for its efficiency and ease of installation.

“It was more efficient than having to cast in place and pour that large of a vault onsite,” Haselden said.

“Logistically, in terms of mountain concrete availability, we have a high level of difficulty getting a lot of concrete quickly just because there’s a very limited supply,” she said. “Because of this, precast is always a good option.”

Snyder said Oldcastle received good feedback on the stormwater system from the project’s owners, who were pleased that StormCapture came with a 5-year structural warranty. Haselden says the general contractor was especially pleased with the speed at which the precast system was installed and ready to use.

“They were able to place 10 to 12 semis’ worth of precast pieces and vaults within a day and a half. So, from a speed standpoint, it was definitely a lot faster than we would typically see with a poured in place product,” Haselden said. “Once the prep work was done, everything fit together very well.”



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**Stackable Bolsters**  
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**Beam Bolster Uppers**  
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By Shari Held

Shari Held is an Indianapolis-based freelance writer who has covered the construction industry for more than 10 years.

# Cleanup in Cleveland

**PRECAST CONCRETE FEATURES  
PROMINENTLY IN A PROJECT TO REDUCE  
POLLUTION IN LAKE ERIE**



Project Clean Lake, a \$3 billion, 25-year undertaking by the Northeast Ohio Regional Sewer District (NEORSRD) in Cleveland, aims to reduce raw sewage discharge in Lake Erie by 4 billion gallons per year. The plan calls for the installation of seven underground tunnels — ranging in length from 2 to 5 miles each. These tunnels, lined with precast concrete segments, will capture and store 98% of Cleveland’s sewer overflow so it can be treated at one of NEORSRD’s three wastewater treatment plants. The plan also includes deep-tunnel pump stations and improvements to the treatment plants to handle increased capacity.

“We’re held to a much higher capture rate than other municipalities because our overflow goes to Lake Erie, and Lake Erie is the shallowest of the great lakes and the one that holds over half of the Great Lakes wildlife,” said Robert Auber, CCM, construction manager for NEORSRD.

Planning began in 1995, with work on the tunnels starting in 2011. Euclid Creek, Dugway, Doan Valley and Westerly tunnels are completed and fully operational. Shoreline is currently under construction, and the Southerly and Big Creek tunnels should be completed within two-and-a-half years. Construction of these main tunnels constitutes 96% of the project.

“Tunnels are becoming more and more prevalent in the urban landscape with cities growing larger and the EPA emphasis on cleaning up the environment,” said Chris Lynagh, P.E., STSC, project manager for the Shoreline Tunnel for McNally Tunneling in Cleveland. McNally Tunneling also worked on the Euclid Creek and Doan Valley tunnels.

## ON-THE-JOB LEARNING

Euclid Creek, the first single-pass tunnel NEORSRD built, began the learning process.

“We made it through a lot of trial and error from Euclid Creek to Shoreline,” Auber said.

As the precast tunnel segments are placed, grout is injected through the segments to fill the voids left by overcut and the tunnel boring machine (TBM) skin thickness. Getting the grout mixture right was the most critical part of the job because, as Auber said, “the whole success and schedule of the job was based on it.” The precast segments are grouted in place to withstand the pressure of the tunnel boring machine’s thrust. It was imperative that the grout set within 30 seconds. After more than 70 tries, they finally achieved success.

Guide rods, installed on the radial joints of the precast segments, were introduced to the tunnel requirements with the Doan Valley project. These guide rods allow the correct positioning and the longitudinal alignment of precast segments.

“That was not a common practice when the Euclid Creek tunnel was built,” said Reece Armitage, vice president and quality control & projects manager for CSI-Tunnel Systems, which fabricated the precast segments. “Now, guide rods are on almost every tunnel project.”

Another issue that had to be addressed was the handling and storing of the huge precast segments to avoid cracking.

“When the segments are in their final configuration underground, they’re in a circle,” Lynagh said. “A circle or cylinder



behaves well in compression when the ground is squeezing against it. It’s what the segments are designed for. But when you are handling them on the surface – transporting them, lowering them to the shaft, getting them to the TBM – it’s critical to carefully calculate all those loadings to ensure you’re not overstressing the segments. Being diligent on the transportation process and the handling of the segments is a key thing we learned over all the projects, and it’s something we put a big emphasis on.”

With every project, the team learns something new.

“Shoreline is, so far, the best quality build with the segments we’ve had so far,” Auber said.

## BUSINESS AS USUAL

To date, CSI-Tunnel Systems’ Macedonia, Ohio, plant has fabricated the precast segments for the first five Project Clean Lake tunnels.

“We do only one thing — make concrete segmental liners for tunnels,” Armitage said. “And we’ve been doing it for 28 years.”

CSI educated NEORSRD about the characteristics of fiber reinforced concrete compared to steel rebar, and the agency opted to try it out.

“We did fiber distribution tests where we broke the segments to see how the fibers were distributed within each panel,” Auber said. “We had the distribution we needed, the tensile strength, the flexural strength – plus, it mitigated corrosion. The steel fibers are

discontinuous so they don't corrode like rebar would."

CSI used a 675-pound cementitious content mix, including silica fume, to achieve an extremely high-performance, low-permeability concrete. The mix is poured into Cleco molds, finished at a workstation, placed into a kiln for five hours and then transported to the yard to cure. It's an assembly line of which Henry Ford would be proud.

"During the day, we pour one element every five minutes," Armitage said. "This is what we do. All these projects went quite smoothly."

Durable precast concrete has a lifespan of 100-plus years, which was one reason it was selected as the building material.

"Precast is becoming the norm for these kinds of tunnels," Armitage said, adding that it does depend on the ground conditions.

Each tunnel ring is composed of six segments. For the Euclid Creek project, CSI fabricated 18,900 segments (3,150 rings). Each ring weighs 26 tons. The dimensions of the segments are 24 feet inside diameter by 12 inches thick by 5 feet long. The heaviest weighs 11,700 pounds, while the lightest weighs 6,300 pounds.

The Shoreline project consisted of 14,004 segments (2,334 rings), with each ring weighing 67,700 pounds. The segments measure 23 feet inside diameter by 12 inches thick by 6 feet long. The heaviest weighs 12,977 pounds and the lightest 4,166 pounds.

## HITTING THE ROAD

Flatbed trucks transported the segments from Macedonia to the Cleveland job site — about a 40-minute drive. Besides containing costs, keeping the project eco-friendly is a major concern. The Shoreline project is "green," with a 17% reduction in carbon emissions. Proximity to the job site factors into that accomplishment.

Great care was taken in loading the segments, with timber cribbing placed strategically to reduce stress on the segments. For the first four tunnel projects, CSI loaded six segments on one truckload.

"But the Shoreline segments are 6 feet in length, so we had to be creative," Armitage said. "We put four pieces of a ring on one truck, three times. Then we loaded the fourth truck with six smaller pieces."

"During transportation is where a lot of the micro-cracks can occur," Lynagh said. "When you get underground and start thrusting off them with the TBM is when the microcracks open up."

## PUTTING IT ALL TOGETHER

Once the precast segments arrive at the job site, a segment clamp places them on the ground until they are lowered into the shaft. Then a Multiphysics vehicle transports them to the heading of the TBM where hydraulic machines unload them. Finally, a segment crane sets the segments on a tray that feeds them to the tail shield of the TBM.

Most tunnel work takes place 150 feet underground. Safety is a major concern.

"There are a lot of issues with shale," Auber said. "There can be fallout between the bedding planes or the crown area. Plus, shale



contains methane gas. A single-pass tunnel allows you to mitigate any gas issues and allows you to prevent any fallout associated with shale."

The basic installation steps are similar for tunnels bored from Chagrin shale (Euclid Creek, Dugway, Doan Valley, Westerly, Big Creek) and soft soil (Shoreline, Southerly). The TBM installs the six precast segments that make a ring. The segments are anchored together, then grouted in place. Then the TBM moves forward, thrusting off the newly installed ring, and installs another set of rings. Workers are never in front of the machine. They are always working in a finished tunnel, which makes it safer.

There are differences in the installation of the segments in shale and soft soil, though. Tunnels built in shale have cast-in-place starter tunnels. These tunnels, up to 350 feet in length, are large enough for the TBM to be lowered underground in pieces, where it is assembled.

For Shoreline, the first soft ground tunnel, a 26-foot earth pressure balance TBM, designed especially for 6-foot segments, was used to stabilize the tunnel and equalize the pressures from the excavation in front of the machine. Embedded neoprene gaskets are used around the entire circumference of the segments to seal each segment to the adjacent one to help the tunnels withstand the higher ground pressure, and foam strips were added to ensure the grout didn't leak into the TBM's tail shield. Since the segments were so heavy, extra care had to be taken with the handling process.

Installation on Shoreline was quick.

"We installed 126 feet in a single 24-hour day," Lynagh said. "That's our best day to date on the Shoreline tunnel project."

## FORWARD LOOKING

Project Clean Lake presented many firsts for the NEORS, which isn't afraid of change.

"Life is dynamic, and you have to follow that path," Auber said. "Nothing good happens when you're reactionary. Other agencies around the country come to us to see how it's done — the grout mix, using plastic fibers in the cast-in-place, using steel fibers in the precast segments. These are all firsts (for us). It's a win-win for the community."



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# THE PRECAST SHOW 2024:

## DOWN TO BUSINESS IN DENVER



By Heather Bremer

Heather Bremer is the  
director of communications  
at NPCA.

*Photos by InSync Photography*

### MILE HIGH CITY HOSTS ANOTHER SUCCESSFUL SHOW WITH NEAR-RECORD CROWD.

The Precast Show headed West for 2024, spending three wonderful days in Denver, Colo., to get the business of concrete done.

More than 5,300 manufactured concrete industry professionals gathered for the Grand Opening on Thursday, Feb. 8, taking in the nearly 90,000-square-foot Show floor filled with 376 exhibitors.

NPCA members visited booths to see the latest technology and build relationships with vendors who help fuel the precast concrete industry. In addition to engaging displays, attendees

were treated to T-shirt printing, virtual reality experiences and unique giveaways.

Here is a rundown of some of the key moments and events at The Precast Show 2024:

#### KEYNOTE LUNCHEON

Nearly 600 people attended Thursday's Keynote Luncheon to celebrate the accomplishments of association members and kick off The Precast Show 2024.

A record 76 men and women received their gold hard hat and certificate as they graduated from





Check out all of The Precast Show 2024 photos at NPCA's Flickr account: [Flickr.com/photos/nationalprecast.](https://www.flickr.com/photos/nationalprecast/)

Denver Skyline



IMAGE COURTESY OF COLORADO CONVENTION CENTER

the NPCA Master Precaster program. The signature NPCA education program includes two years of study covering precast basics, safety, production, technical, quality control and leadership. See story on Page 28.

This year's class brings the total number of Master Precaster graduates to 433. That mark should surpass 500 during the 2025 show. Grads past and present were celebrated Friday night at The Bash.

The luncheon also included celebrations of the Leadership NPCA cohort, NPCA plant certification anniversaries, Safety Awards winners and Best Practices Awards winners as well as a keynote address delivered by Aron Ralston, whose incredible tale of survival inspired the Oscar-nominated film "127 Hours."





## BRENDA IBITZ SAYS GOODBYE

After decades of service to the precast industry and as manager of The Precast Show, NPCA Vice President of Development Brenda Ibitz will retire in April. The Precast Show 2024 marked her final event, and the Exhibitors Forum Breakfast provided the perfect opportunity to honor her contributions.

A team of Associate members, lead by Magda Muka, gathered donations, created a video montage and presented Ibitz with gifts during a special tribute to close the breakfast.

Ibitz is planning to move to Florida and pursue ministry in a Miami-area prison.

## PLANT TOURS

Nearly 600 people woke up early Thursday morning to catch a bus to The Precast Show Plant Tours. One group headed to Lindsay Precast in Dacono, Colo., for a walking tour of the 42-acre property. A second group traveled to Wells in Brighton, Colo., where they drove through the 60-acre property.

The sold-out tours took attendees behind the scenes to see how Lindsay and Wells operate.



Clockwise from top left: Brenda Ibitz was honored by the Associate members for her years of service; the Show floor was a popular gathering spot for members; exhibitors brought new technology and signature products; attendees tour Lindsay Precast; and The Bash offered a chance to show off your karaoke skills.







Clockwise from top left: Atlantic TNG took home first place in the Best Practices Awards; Aron Ralston was the keynote speaker; the Show floor was busy during the Grand Opening; and education sessions offered a chance to exchange ideas with other industry professionals.

## EDUCATION

Precast industry experts led two days of education classes, drawing 1,244 attendees for discussions on concrete production and repair, leadership and management, and quality control. This year's show also included a track focused on workforce development, aiming to help members identify how to tackle retaining and developing their current workforces plus attract new employees.

Among the 1,244, attendees were a record number of individuals attending PQS classes, including 112 in PQS II – Production and 64 in PQS III – Leadership. These students took steps toward becoming Master Precasters by completing one of the six required courses.

## PRIZE GIVEAWAYS

Spending time on the Show floor paid off in a big way for 10 lucky attendees. The Precast Show gave away more than \$10,000 in prizes to randomly selected attendees, who were entered simply by walking through the doors.

Winners had 15 minutes after their name was called to meet the Prize Patrol Cart and claim their prize, which ranged from a wine chiller to the \$5,000 grand prize, which was taken home by Alex Burkhart of Smith-Midland in Midland, Va.





## STUDENT COMPETITION

The New Jersey Institute of Technology was crowned champion of the NPCA Foundation Student Design Competition, delivering the winning presentation on stage at The Precast Show. McNeese State, Cal State-Chico and Texas State also presented as finalists.

NJIT earned \$7,000 in prize money, divided among participating students and the school's Concrete Industry Management program.

## SILENT AUCTION

The Silent Auction, a joint venture by the NPCA Foundation, PCI Foundation, ICPI Foundation and NCMA Foundation, raised more than \$128,000 to advance the precast concrete industry through academic grants, scholarships and curricula development.

Big ticket items this year included tickets to the Kansas City Chiefs, top-of-the-line electronics, food packages and more.

## FINAL EVENT

On Saturday night, attendees took a magical journey under the sea at Downtown Aquarium, home to 500 animal species, including Sumatran tigers, sting rays, sea turtles and large sharks.

Visitors were entertained by mermaids and divers as they walked through the exhibits, enjoying food and drinks along the way. They also had the opportunity to interact with a pair of tortoises and touch sting rays and jellyfish.

In the lounge, a raucous band played as members danced and celebrated another successful week at The Precast Show.



Clockwise from top left: NPCA's Brad Chinery converses with a member at the new NPCA booth; Master Precasters played pool at The Bash; Afinitas created screen-printed shirts on site; participants in the Student Design Competition were recognized during The Bash; and attendees celebrated another successful show under the sea at the Downtown Aquarium.



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# WORKING for YOU



NPCA's Nick Rhoad, Brenda Ibitz, Chris Frederick, Kathy Ritsmon, Blake Daniels and Brad Chinery, P.E., were in Las Vegas on Jan. 23-25 to represent the industry at World of Concrete.

The annual show brings together producers, vendors and industry members from around the globe to share and discuss new technologies and systems.

NPCA hosted a booth on the Show floor and took advantage of the opportunity to talk with current and potential members, coordinate with exhibitors and gather valuable leads in education, technical services and sales.

Rhoad is president and CEO at NPCA. Ibitz is vice president of development. Frederick is senior director of membership and regulatory services. Ritsmon is director of education programs, and Daniels is director of marketing. Chinery is vice president of technical services.



## NPCA ON THE ROAD

### ASTM C27 COMMITTEE MEETINGS • Dec. 4-6, 2023

NPCA professional staff members were in Washington, D.C., to attend the annual meeting of ASTM Committee C27 on Precast Concrete Products and Committee C09 on Concrete and Aggregates.

Hugh Martin, P.E., Ron Naumann, P.E., and Chinery represented the precast industry at each of the subcommittee meetings. Martin currently serves as the Vice Chair of Committee C27.

Committee C27 has jurisdiction over 37 ASTM standards, including standards for precast water and wastewater structures such as ASTM C913, ASTM C1227 for septic tanks and C1613 for grease interceptor tanks, with many more in the works.

### Here are some highlights from the meetings:

- **Subcommittee C27.10 on Utility Structures**  
Improvements to ASTM C1802 on fabricated metal hatches will undergo another round of balloting. A task group was formed to review the C857 design loading standard before balloting for renewal.
- **Subcommittee C27.20 on Architectural and Structural Products**  
Several revisions to ASTM C825 on precast concrete barriers were recently balloted, with more revisions to be balloted in 2024.
- **Subcommittee C27.30 on Water and Wastewater Structures**  
The subcommittee recently made changes to a number of its standards and will now shift its focus to reorganizing ASTM C913, one of C27's most widely referenced standards. Task groups were also established to begin work on developing three new standards for fire suppression tanks, oil/water separators and for hydrostatic testing.
- **Subcommittee C27.40 on Glass Fiber Reinforced Concrete**  
The subcommittee will be working on adding four new

## 2024 Webinar Lineup

NPCA's webinar package for 2024 includes four opportunities to interact with industry experts on topics that affect every precast concrete facility.

Webinars are sold on a facilitywide basis, so multiple workers at the same location can benefit from them. By purchasing the 2024 package, you also receive access to NPCA's entire library of one-hour webinars for the year. Webinars also are available on an a la carte basis.

### HERE IS THE 2024 LINEUP:

**MAR  
14**

**Build America, Buy America:  
What You Need to Know**

**JUL  
11**

**Introduction to Rigging  
Safety**

**MAY  
9**

**EPDs: Update on Industry  
Requirements and How to  
Obtain Them**

**SEP  
19**

**MIC in Wastewater Treatment:  
What to Know and How to Protect  
the Structures Affected**

Visit [Precast.org/webinars](https://www.precast.org/webinars) for pricing and registration.





NPCA awarded scholarships to 10 universities competing in the the ASCE Concrete Canoe Competition to help the teams offset construction and travel costs.

standards in 2024. One of the standards that will soon be balloted pertains to the flowability of GFRC in its plastic state, while another pertains to the chop rate of fibers as they are introduced into the GFRC mix.

- **Subcommittee C27.50 on Terminology and Correlation**

The subcommittee has begun correlating the materials sections of all C27 standards, starting with the materials sections of ASTM C1776 and C1227 before eventually covering all C27 standards. The subcommittee is also working on a new terminology standard that would essentially be a collection of definitions found in the Definitions sections of all C27-related standards.

- **Subcommittee C27.70 on Precast Concrete Products for Stormwater Management**

The subcommittee will soon be balloting a new standard guide for precast concrete stormwater management systems.

#### **WWETT SHOW • Jan. 24-27, 2024**

Claude Goguen, P.E., Naumann, Rhoad and other members of the NPCA staff represented the industry at the annual gathering of wastewater and environmental services professionals. NPCA also debuted a new booth for the show, focused on sharing the benefits and strengths of precast concrete.

#### **IOWPA ANNUAL CONFERENCE • Feb. 20-21, 2024**

Goguen and Naumann attended the Indiana Onsite Wastewater Professionals Association annual meeting. IOWPA strives to support Indiana's onsite wastewater professionals through education, installer and inspection certificate programs, and the promotion of best practices.

**For a full list of where NPCA staff members are going and where they have been, visit [precast.org/advocacy](https://precast.org/advocacy).**

### **CONCRETE CANOE SCHOLARSHIPS**

NPCA in December awarded scholarships to 10 universities that are sending teams to the ASCE Concrete Canoe National Competition, provided to help teams offset the cost of construction and travel.

The ASCE Concrete Canoe Competition provides students with an opportunity to gain hands-on practical experience while testing their skills with concrete mix designs and project management. Known as the "America's Cup of Civil Engineering," the competition began in 1988 and combines engineering excellence, hydrodynamic design and racing technique.

#### **NPCA awarded \$500 scholarships to:**

- ▶ University of Cincinnati
- ▶ University of Wisconsin at Platteville
- ▶ Kansas State University
- ▶ Louisiana Tech University
- ▶ University of North Carolina
- ▶ California Polytechnic State University
- ▶ Colorado School of Mines
- ▶ Lipscomb University
- ▶ Purdue University
- ▶ University of Texas at Arlington



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# People & Products

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For possible inclusion, send your press releases and photos to [hbremer@precast.org](mailto:hbremer@precast.org)

## ALL ADDS NEW HYDRAULIC CRAWLERS

The ALL Family of Companies has added a new package of Kobelco G-3 Series hydraulic crawler cranes to its fleet.

The new G-3 models were created using input from end users derived from real jobsite experiences. They incorporate transport, assembly and operator-friendly concepts. Other features include boom, carbody and track side frame structures designed with ease of transport in mind. The new cab and design of the cranes add to the operator's comfort and safety.

The new cranes will be deployed across ALL's 33-branch North American footprint, where they will find ample work in bridge construction, plant work, foundation work and more.



ALL's Kobelco G-3 Series hydraulic crawler crane

## HAMILTON KENT HAS NEW SALES MANAGER

Hamilton Kent recently announced the appointment of **Marcus Barnett** as U.S. Sales Manager.

Since early 2018, Barnett has served



Marcus Barnett

as the Territory Manager for the U.S. East. Prior to joining Hamilton Kent, Barnett spent nearly two decades at Forterra Building Products and Sherman Dixie Concrete Industries, honing his skills and gaining invaluable experience in the concrete pipe and precast industry.

## PEACOCK NAMED M.A. INDUSTRIES CEO

M.A. Industries recently announced the promotion of **Scott Peacock** (grandson of founder Bob Peacock) to president/CEO.

Peacock joined the company in 1992. Since joining the family business, he has worked in all facets of the process from operating machinery to loading trucks. In 2000, he joined the customer service team. In 2004, he became the sales manager for the precast products side of the business. In 2017, he was named senior vice president. Peacock served on the NPCA Board of Directors from 2009-2012.

M.A. is a third-generation business and operates four distinct divisions serving



Scott Peacock

the precast industry, lead-acid battery industry, liquid handling industry and pulp and paper industry.

## HOOK NEW SALES DIRECTOR AT VOLLERT

Vollert USA Inc. recently announced **Dana Hook** will lead the sales activities for the subsidiary of the German plant specialist Vollert Anlagenbau as executive sales director for North America.

The mechanical engineer has extensive expertise with more than 30 years of sales experience in the paper and construction industries, among others.

Hook plans to further establish Vollert's technology in the USA and Canada, driving forward the current expansion in North America and exploiting synergies.



Dana Hook

## TAYLOR GROUP ACQUIRES CVS FERRARI

The Taylor Group of Louisville, Miss., recently announced the acquisition of 85% of the shares of CVS Ferrari (CVS) from NEIP III and BP.

Founded in 1927, Taylor is one of the largest, privately owned American manufacturers of heavy industrial lift equipment, intermodal and construction industry equipment.



The Taylor Group

CVS, founded in 1973, is an established manufacturer of high-quality mobile container handling and heavy cargo handling equipment in reach stackers and high-capacity forklifts. CVS is a front-runner in offering digital integration and innovative electric and hybrid solutions with patented energy recovery and regeneration systems with the lowest environmental footprint.

### HILL AND GRIFFITH UNDER NEW OWNERSHIP

**Mike Lawry** and **Ryan Canfield**, two long-term executives of The Hill and Griffith Company, have completed the purchase of all assets of the company and that of HG Logistics.

Lawry has spent 32 years with The Hill and Griffith Company and has served as chief operations officer since 2012. He will now serve as its CEO and as president of HG Logistics.

Canfield has been with The Hill and Griffith Company for 17 years, most recently as executive vice president of sales and marketing. Canfield will now serve as CEO for HG Logistics and president of The Hill and Griffith Company.

### JENSEN ACQUIRES SOUTHWEST CONCRETE PRODUCTS

Jensen Precast, an independent family-owned manufacturer of precast concrete infrastructure products since 1968,



recently announced that it has acquired Southwest Concrete Products in Ontario, Calif., from CalPortland.

Jensen Precast has operated a precast concrete facility in Southern California since 1989 in the City of Fontana, primarily providing underground electric and telecommunication utility products, septic tanks, grease interceptors and Caltrans highway barriers. Southwest Concrete Products, founded in 1966, has vast experience and resources in the sewer and storm drain manhole and drainage inlet markets in Southern California.

### ALL GETS NEW TERRAIN CRANE

The newest rough terrain (RT) cranes from Liebherr are set to make their world debut in the field when the ALL Family of Companies takes delivery of the first five units early this year. The Liebherr LRT 1130-2.1 boasts the strongest-in-class 140-USt capacity and the longest telescopic boom (197 feet) of any two-axle RT in the world.



ALL Crane's LRT 1130-2.1 terrain crane

Apart from its high performance, the LRT 1130-2.1 delivers the most economical transport dimensions of its performance class, able to be transported on conventional low loaders anywhere in the world.

Designed to make transport between jobsites simple and economical, the dimensions of the LRT 1130-2.1 allow it to be transported on low-loaders without disassembly of the basic unit.

### CONSEAL PROMOTES CURTIS TO SALES MANAGER

Concrete Sealants recently announced the promotion of **Chad Curtis** to national sales manager, overseeing sales in the U.S. and Canada. Since 2021 as marketing

manager, Curtis focused on product line branding and reinforcing ConSeal's customer-focused business philosophy. Curtis is a member of NPCA's Outreach



Chad Curtis

Committee and serves as the secretary-treasurer of Ohio Precast Concrete Association's Board of Directors.

Prior to joining Concrete Sealants, Curtis was the creative director for ZE Design, working directly with major professional and collegiate sports programs helping them turn their facilities into storytelling showpieces.

"Since joining ConSeal, Chad has proven to be a servant leader internally to colleagues and externally to customers. I'm excited for Chad to join me as the faces of leadership at Concrete Sealants to our customers and our industry," ConSeal Vice President Jesse Wingert said.

### FRECKMANN RETIRES FROM DAWES

The new year brought big changes to Dawes Rigging & Crane Rental, a member of the ALL Family of Companies, as



Steve Freckmann

it will be the first time in more than three decades that **Steve Freckmann** isn't its general manager. Freckmann retired at the end of 2023 after 34 years as GM and 45 total years with Dawes.

Freckmann is a crane business lifer, starting out part-time in the shop and yard as a pre-teen. In fact, it was Freckmann's father, Thomas, who was a part owner of Dawes before selling to the ALL Family in the late 1970s. Steve Freckmann succeeded his dad as general manager in 1989.

**Ryan Harrison**, branch manager of the Madison, Wis., Dawes branch and a 24-year ALL veteran, will succeed Freckmann as general manager.





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# Calendar of Events



SEPT. 26-28, 2024

**NPCA 59th ANNUAL CONVENTION**

JW Marriott Tucson Starr Pass  
Resort & Spa  
Tucson, Ariz.



FEB. 5-7, 2025

**THE PRECAST SHOW 2025**

JW Marriott Indianapolis  
Indianapolis



OCT. 2-4, 2025

**NPCA 60th ANNUAL CONVENTION**

Amway Grand Plaza  
Grand Rapids, Mich.

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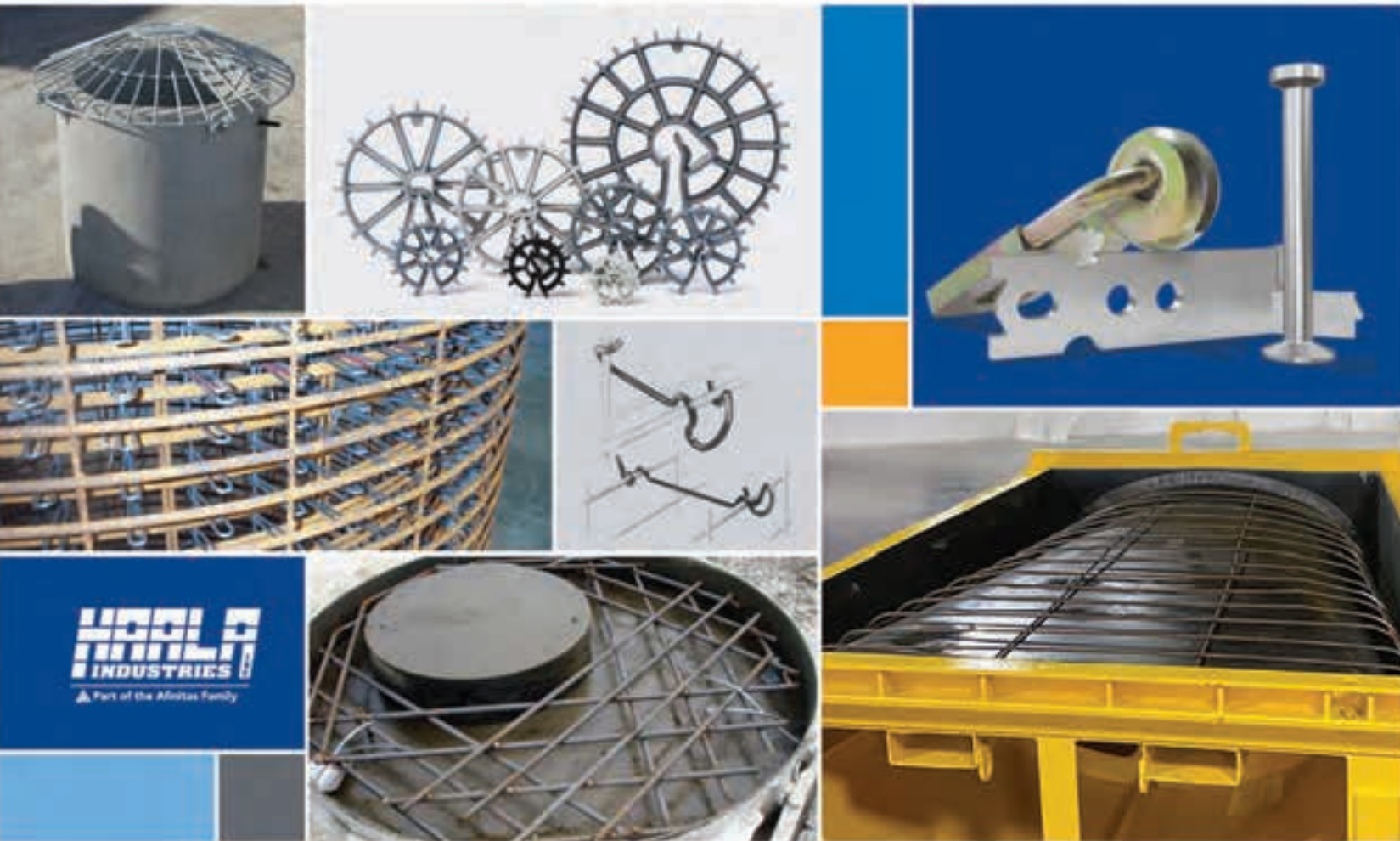
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