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A Quarterly Publication of the National Precast Concrete Association | Q2 2022

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Q2 2022



Photo courtesy of Olson Precast Company

Olson Precast Company

Work Hard, Play Hard

36 Mike Olson knows the benefits of a work-life balance and makes it a priority to ensure that his employees enjoy all that the southwest United States has to offer.

On the Cover:

(From left) Mike Olson, Ken "Dak" Spears and Frankie Pelton know how to mix business and fun while working in Las Vegas as part of the Olson Precast Company crew.

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Email NPCA Professional Development Coordinator Ramona Evans at revans@precast.org to register or learn more.



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CHAIRMAN'S INSIGHTS

A Message from NPCA Chairman Mark Wieser



Summer is just around the corner, and with it comes the opportunity to spend time with family, friends and our communities at large. The industry is robust and, as we saw at The Precast Show in Kansas City, the precast community is strong as well.

The Precast Show 2022 was an enormous success. It was wonderful seeing everyone in person again, walking the show floor and seeing all of the new products, services and technology. With a record 82,000 square feet of booth space and more than 4,600 people registered to attend, we showed that the industry is ready to move forward post-pandemic.

Speaking of which, let me reemphasize something I talked about during the Keynote Luncheon. The U.S. Department of Transportation, through the bipartisan infrastructure act, already is allocating money to the states to repair roads, bridges and other projects. Don't wait and miss out on opportunities already available. Be sure to visit [transportation.gov](https://www.transportation.gov) to see the state-by-state breakdown of funds and see where dollars are being spent in your area.

It was my honor during The Precast Show to help recognize Mel Marshall and bestow upon him the title of Honorary Master Precaster. Mel is a fierce champion of the industry and the heart and soul of NPCA's Production and Quality School. It is because of Mel, my late father and that entire generation that the precast industry stands where it is.

Regarding my father, the entire Wieser family is honored and awed by the outpouring of love the NPCA family has showed since his passing. NPCA members have donated more than \$100,000 in his memory to benefit the NPCA Foundation and the good work that it does. We will have more news on that soon.

As Chairman, I continue to work hard every day to further the legacy that Mel, my father and so many others have built. As days lengthen and warm weather arrives, it always seems there is more work to be done. But also make sure to set aside some time to connect with your loved ones, build on existing relationships and forge new connections.



BOARD REPORT: The following is a report on the NPCA Board of Directors' meetings for the first quarter of 2022.

MARCH 6 – AT THE PRECAST SHOW

- Approved minutes from Dec. 14, 2021, Board meeting.
- Approved the 2021 financial audit.
- Approved the 2021 IRS Form 990 and 990T.
- Approved the Jan. 31, 2022, financial statements and investments.
- Approved the final language for the NPCA Quality Control Manual.
- Approved the proposed rule change for the Top Gun Award and the Hoskins Award. Also renamed the Top Gun Award to the Tom Vildiville Top Gun Award.
- Renewed two funding requests with a final vote scheduled for the Spring Board Meeting on March 31: The NPCA Foundation request to donate \$5,000 to Concrete Industry Management program and a request from the Education Committee to translate the Onboarding Program into Spanish.
- Received updates on The Market Research Study and NPCA research projects.

MARCH 29-31 – AT THE SPRING BOARD MEETING

- Made an initial review and revision of the association's bylaws and policies.
- Approved minutes from the March 6 Board meeting.
- Received Treasurer's Report, including financial statements and investment summary.
- Received a request from the NPCA Foundation on a CIM donation.
- Approved creating a Spanish version of the NPCA Onboarding Program.
- Received an update on the market research study that will support and complement NPCA's strategic plan.
- Reviewed The Precast Show 2022, previewed Committee Week 2022 along with fall Annual Convention and discussed other future events.

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Questions from the Field



Questions from the Field is a selection of questions NPCA Technical Services engineers received from calls, emails and comments on blog posts or magazine articles posted on precast.org.

If you have a technical question, contact us by calling (800) 366-7731 or visit precast.org/plant-resources/technical-services

Stanley asks:

Is there an ASTM chart that shows the allowable wall thicknesses for a round, 6-foot diameter pump station?

NPCA technical experts answer:

ASTM C478, “Standard Specification for Circular Precast Reinforced Concrete Manhole Sections” outlines requirements for the manufacture of precast concrete manhole sections.

Section 14.3 states, “The minimum wall thickness shall be one-twelfth of the largest internal diameter of the riser or conical top.”

Additionally, Section 14.7.2 states, “The wall thickness of risers and conical tops shall be not less than that prescribed in the design by more than 5% or plus/minus 3/16 inches (plus/minus 5 mm), whichever is greater. A wall thickness greater than that prescribed in the design shall not be cause for rejection.”



NPCA file photo

ASTM C478 includes information for allowable wall thicknesses for a round, 6-foot diameter pump station.

Oliver asks:

What kind of mask is required for concrete buffing work and concrete grinding?

NPCA technical experts answer:

The type of mask required for concrete buffing and grinding work depends on a variety of factors, including whether the work is being done indoors or outside, how long the work is being performed and what type of filter the buffing or grinding equipment has attached to it, among other factors.

To find the requirements that apply to your specific scenario, check out Table 1, “Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica” in OSHA 1926.1153(c)(1) on Respirable Crystalline Silica, available here: <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1153>

Also, the NPCA Exposure Control Plan for Respirable Crystalline Silica is free to members. This document provides information on the hazards associated with silica dust and outlines the steps to take to ensure employees who work with, or around, silica are not exposed to hazardous levels of silica dust. It also provides procedures for common silica-related work duties to minimize exposure in accordance with the OSHA Air Contaminants standard. Visit the NPCA Shop at www.precast.org to download it. **PI**



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NPCA provides a free crystalline silica safety document that is available in the Technical and Product Resources section at precast.org.

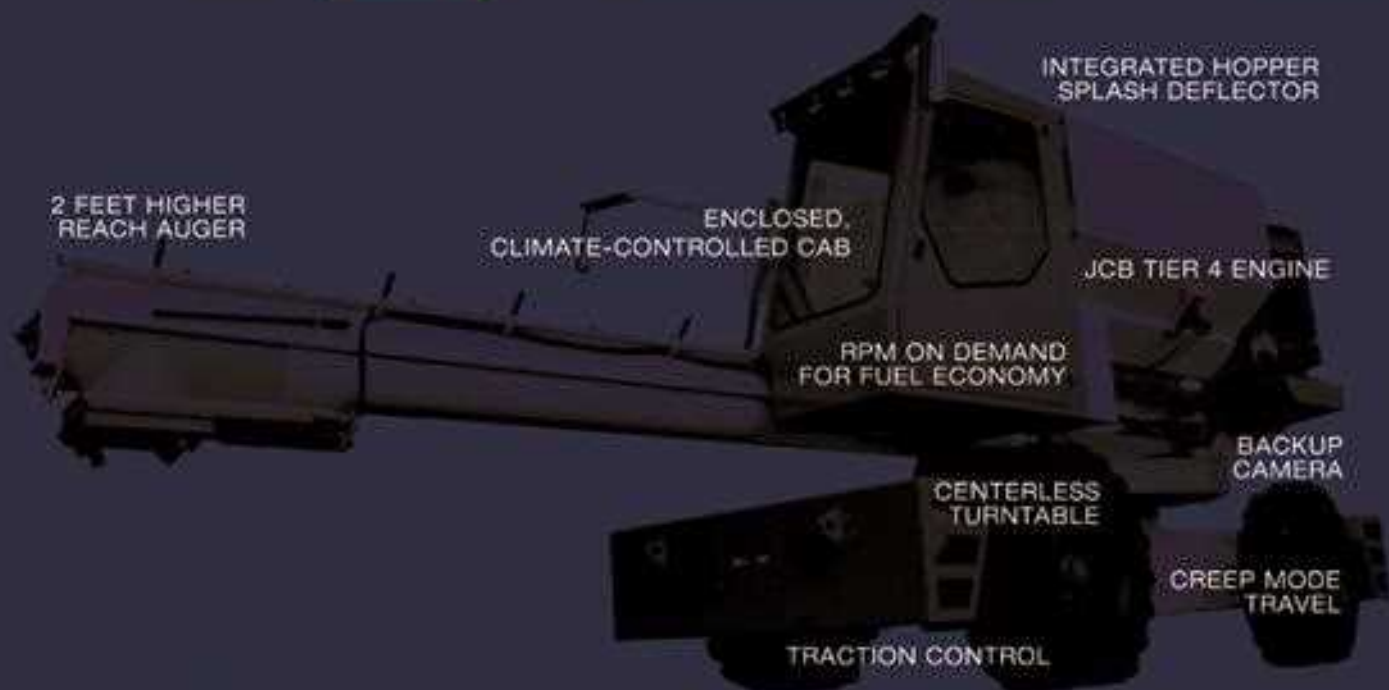


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Don't Cut Corners:

How to Achieve Quality Corners and Edges in Precast Concrete Products

An Ounce of Prevention Helps Avoid Rough Edges

By Claude Goguen, P.E., LEED AP



Precast concrete manufacturers strive to achieve the best finish on all structures, whether products are destined for a downtown building veneer or buried in a backyard.

Concrete surface imperfections not only can be unsightly, but they also can affect the structure's performance and durability.

Achieving a good surface finish can be especially challenging at the bottoms or corners of precast products, where the formwork changes direction and may be discontinuous.

ROOTS OF ROUGH EDGES

Concrete is a homogenous composite material containing water, cementitious materials, admixtures and fine and coarse aggregates. Placing this mass of fluids and solids into formwork and achieving a smooth finish is both an art and a science.



NPCA file photos

Leaky forms, form release overapplication and improper consolidation are among the causes for rough edges in precast concrete structures.

The fresh concrete's final position invariably includes narrowing areas of formwork where the concrete meets adjoining right angles at formed surfaces. This could be the bottom of a manhole where the pallet meets the outside jacket or the vertical outside corner of a catch basin.

Also susceptible to imperfections are exposed or unformed precast product edges such as the top of a structure where the horizontal finished surface meets the vertical formed surface.

Let's start with edges that are confined on multiple sides by formwork.

▶ Leaky Forms

The No. 1 culprit of rough edges on precast concrete structures are slight openings in form joints that allow the passage of paste, mortar or concrete out of the form.

Paste is the mixture of cementitious materials, admixtures and water. As a liquid, it can escape through very narrow gaps in formwork, especially when under pressure. Mortar is paste plus sand. Because mortar includes sand, it has a higher viscosity than paste, which means it needs a slightly larger gap to escape formwork.

Concrete is mortar plus coarse aggregates, which generally has a higher

viscosity and contains larger constituent materials than mortar, so it needs a substantially larger gap to pass through.

The nature of the escaping paste, mortar or concrete can be revealed by examining the rough corner. For example, if it is a type of honeycombing where there mostly are large aggregates left, mortar may be leaking.

Gaps in formwork are caused by improper use, cleaning and maintenance. If two adjoining form surfaces are not cleaned properly, small chunks of mortar or concrete may be left behind on surfaces. The next time the form is used, a worker may need to use force to close a form clasp, which can damage the form, and thus begins the formation of a gap, which can continue to expand from there.

Sometimes, the formwork itself is not maintained, and the closing systems are not operating at full capacity, leaving a slight opening.

▶ Form Release Overapplication

When it comes to improperly applying form release agent, the No. 1 offense is overapplication.

Depending on the type of form release agent, this can lead to precast product surface issues that include bugholes and staining. Overapplying form release on a vertical or horizontal piece of formwork can further aggravate corners.

The solution comes down to simple geometry. Nozzles for sprayed-on form release agents spray in the shape of a cone or fan, so when workers arrive at a form's corner and turn the sprayer, they hit the same surfaces in an attempt to apply form release agent on the corner (Figure 1). This results in overapplication.

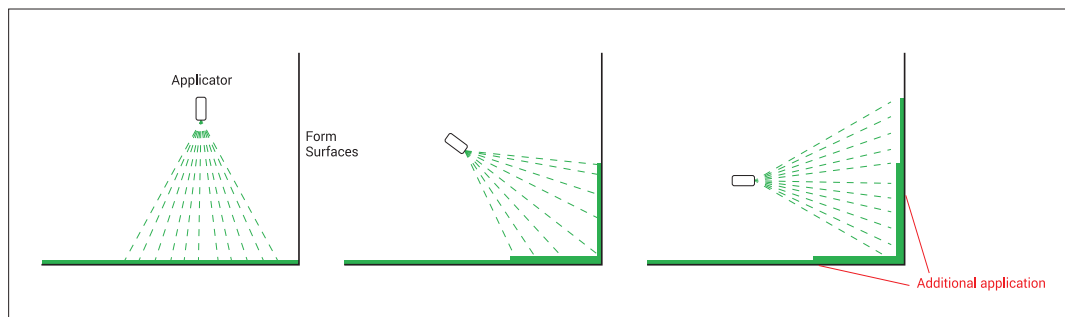
Gravity also magnifies this issue at bottom edges. Overapplied form release will run down the form surface and puddle at the bottom corners. This can be detected and remedied during prepour inspections.

To compare thickness of release agent application in different locations on a single form, run a finger along vertical or horizontal form surfaces that have been sprayed, and notice the thickness of the release agent application. Do the same in vertical or horizontal corners, and take note of the release agent thickness. If there is a noticeable difference and the corners have a heavier application, use this opportunity to train employees on proper release agent application and why it's so important.

▶ Improper Consolidation

All concrete needs to consolidate. Proper consolidation is key to optimizing concrete's density, strength and enhancing durability. Self-consolidating concrete (SCC) does this on its own, while conventional and dry cast concrete need help from internal and external vibration.

When an internal vibrator head enters concrete, its zone of influence depends on many factors, including the vibrator amplitude, head size



NPCA file photo

Figure 1: Risk of Form Release Overapplication in Formwork Corners

and fresh concrete properties. Picture an invisible sphere surrounding the tip of that vibrator head. Any placed concrete that is missed by that sphere experiences a much different level of consolidation.

Form corners, both vertical and horizontal, are prime targets for missed areas of vibrator influence. For bottom corners, an operator may not be lowering the head far enough down into the form. For vertical corners, the operator may be overestimating the radius of influence and fail to insert the vibrator near the form corner one more time.

This issue also can occur with external vibrators affixed to the formwork's outside. External vibrators also have a zone of influence that depends on vibrator amplitude, the manner in which it is attached to the formwork and fresh concrete properties. If not sized, installed, placed and used properly, a vibrators' spheres of influence could miss some corners as well. Undervibrated concrete in form corners may exhibit an area of large irregular-shaped bugholes and honeycombing.

It is not just lack of or insufficient vibration that can cause rough corners. Overvibration also can cause serious issues. An operator could be using the wrong equipment or leave it inserted in the concrete too long. This can result in the heavier particles – in this case coarse aggregates – sinking toward the bottom of the form and pushing mortar and paste to the top.

The concrete finish associated with overvibration typically resembles honeycombing, where large aggregates are visible or exposed with an absence of paste surrounding them.

► It Could Be the Concrete

Concrete itself could be a causal factor in rough corner edges. Proper raw material proportions, batch sequencing and mixing ensure the fresh concrete moves homogeneously within the formwork as intended.

For example, insufficient mix water due to absorption by dry or dirty aggregates can lead to diminished workability that cannot be overcome by typical placing practices. SCC that has lost some stability because of longer-than-usual horizontal flow along a longer piece of formwork also can lead to hitches in corner finishes.



NPCA file photo

Proper cleaning, routine inspections and regular maintenance are necessary to ensure solid corners in formwork.

► It Could be the Forms or the Plant Environment

Placing concrete in hot or cold conditions can cause issues in how the concrete moves and sets, and this can result in edge finish issues.

When placing concrete in higher temperatures, concrete could experience a higher loss of slump or spread, and this affects its ability to be moved and consolidated. Colder temperatures could delay setting and bleed water migration, which can lead to premature finishing and potential issues at top or unformed edges of precast products.

Avoid placing fresh concrete against cold or hot form surfaces. This also can result in finish issues.

ACI 307, "Guide to Cold Weather Concreting," recommends that form surface temperatures should differ no more than 10°F (5°C) greater or 15°F (8°C) less than that of the fresh concrete at the time of placing to avoid inconsistent setting, rapid moisture loss and plastic shrinkage cracking.

SOLUTIONS

There is light on the rough horizon for anyone struggling with these issues.

Imperfect precast product edges and corners easily can be fixed and become a thing of the past. The key is to diagnose the issue and address it at the source.

► Formwork

When two mating surfaces need to be watertight, there usually is a sealant or gasket material involved. Sealants are applied in buildings around outer doors and windows. Caulking is used around tubs and showers. Pipes are sealed together. Two surfaces meeting and expected to stop low viscosity fluid from escaping is a challenge, but we expect precast formwork to accomplish this feat.

Consider the following scenario: It is determined that the formwork is leaking, and paste, mortar or concrete is seeping out. The first thing to do is make sure everything is being used properly. Are engineered form panels installed and fastened correctly? Are form jackets bent or out of square/round, or are moving parts such as hinges and clasps loose?

Remember: Before attempting to fix formwork, contact the form manufacturer to determine best maintenance practices. Also be sure to review the plant's form maintenance program.

The most important steps to avoiding leaky forms are proper cleaning, routine inspections and proper maintenance.

Garrett Hoffman, production supervisor at Creter Vault in Flemington, N.J., recalled when his crew was dealing with rough looking concrete edges. They investigated and found leaks in the forms.

"We set up a rotating schedule for cleaning and maintaining forms," Hoffman said. "I can personally vouch for the difference it made in producing tighter edges. Taking the time to clean your forms allows you to check any welds or joints that have loosened up and settled over time. You can make necessary repairs to see where your leaks might be."

Periodically inspecting clamps, latches and hinges is important. Train employees by demonstrating how to do inspections and how to properly clean forms. A noise that raises hairs on the backs of the necks of



NPCA file photo

Figure 2: Chamfer at precast formwork corner

many plant managers and owners is hearing the distinct, resonating bang of a hammer hitting a form. Training plant personnel to use the right tools and procedures can prolong form life significantly.

Older forms may need to be upgraded or replaced to accommodate changes in manufacturing. For example, a form may work great for years when used with a conventional concrete mix. Then, after switching to SCC, the difference in fresh concrete properties can create a higher hydraulic pressure, which may be just enough to create form leaks where there were none before. All of a sudden, it is time to tighten bolts and clamps and perhaps make other modifications.

Greg Stratis, president of Shea Concrete Products in Amesbury, Mass., experienced this.

“We have found on older forms there just wasn’t enough clamps going up the corner especially when using SCC,” Stratis said. “Also, we have found that the way the clamps are attached to the form in that area, we needed to reinforce the doors in order to take the pressure off the clamps.”

Again, it always is a good idea to consult with the form manufacturer prior to making modifications.

Another option to resolve leaky form joints is to add material to seal the opening. Chamfers are an ideal way not only to seal the open gap but also to produce precast product corners that are harder to chip. (Figure 2)

“One of the most successful methods I have experienced is by adding a 45-degree metal chamfer, which helps with leakage and produces a better-looking edge on the finished product,” said Joe Marin, quality control director at Western Precast Concrete Inc. in El Paso, Texas.

Jason Bartlett of H2 Precast in East Wenatchee, Wash., said they also use chamfers.

“It makes a nice-looking corner and stops the leaks, said Bartlett,

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Here is an example of great looking corners on a large structure.

the purchasing manager at H2. “Also, it helps on the bottom of the product when the forklifts are picking them up to stop the chipping.”

Frank Bowen, business development manager at Jarrett Concrete in Ashland City, Tenn., uses magnetic chamfers.

“Most of my problems are fixed with magnetic chamfers – one of my favorite quick-fix tools,” Bowen said. “We buy 10-foot strips of the steel magnetic chamfers and 8-foot strips of the urethane magnetic chamfers. The urethane magnetic chamfers allow for flexibility and can be used in round structures, which has its advantages for improved resistance to chipping and spalling from jobsite handling.”

Some use rubber gaskets and waterstops in joint corners to prevent leaking. These chamfers and gaskets may require additional cleaning and maintenance and periodic replacement, but it may constitute a better option in the short term.

More temporary fixes include running tape in the form corners and applying a thin layer of grease or a bead of silicone.

If it is time to look at new forms, consult the manufacturer about options to make the joints tighter. Some forms on the market can be purchased with factory-installed gaskets to ensure a tight seal. It may cost more up front but pay for itself in reduced labor and higher quality.

► Form Release Agent

It always is a good idea to review the type of form release agent used and explore its compatibility with different concrete mixes.

Heavy petroleum-based form release agents, for example, resist entrapped air migration more than lighter alternatives. Review the application equipment. Is the spray tip adequate for the intended application?

Remember that in colder weather, workers may have to change spray tips to achieve the same rate of coverage. Try applying form release with a rag or mop in form corners. The most important thing is to train employees on proper application. Visually demonstrate how much agent is sufficient.

► Consolidation

Check with vibrator manufacturers on proper use of equipment. Is the vibrator suited for this specific application? When internal vibrators are used in taller forms, have operators lower the head to the form bottom first before turning it on. Once they know where the bottom is, have them lift it 3-5 inches. At that point, grasp the vibrator shaft where it meets the top of the form or mark it as a reference point to know how deep to lower the head when concrete has been placed.

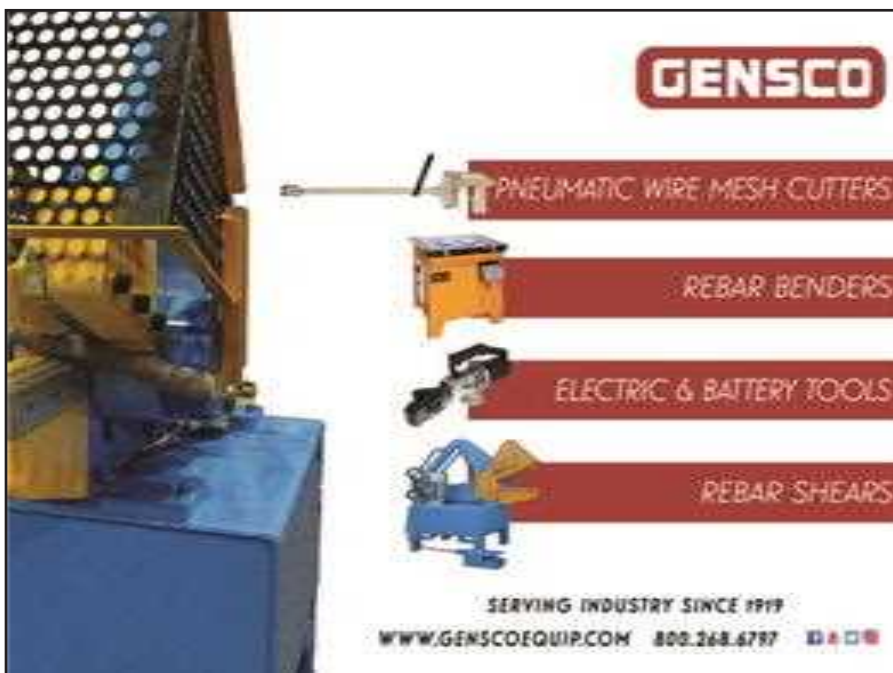
Train employees on proper vibration, demonstrating how to lower it under its own weight, and raise it a little slower (3-4 inches per second) than it is lowered.

Make sure external vibrators are positioned correctly. Ensure operators know when to turn them on as fresh concrete is being placed and how long to let them run.

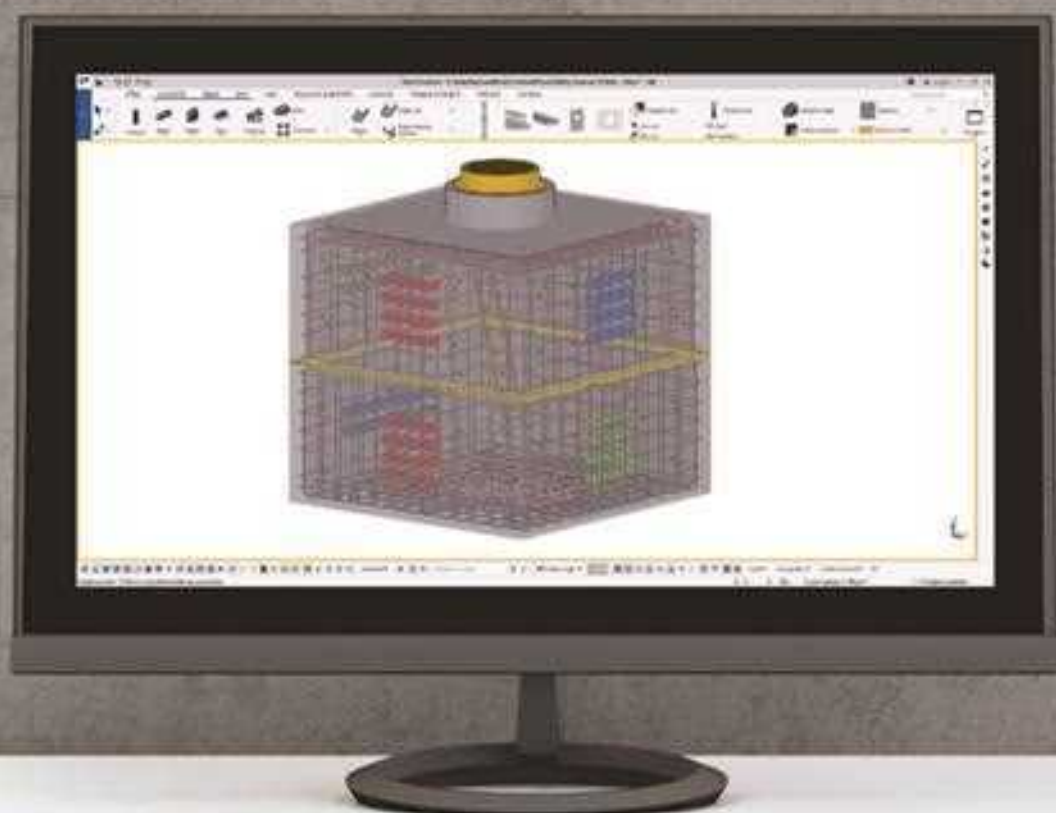
► Concrete Mix and Placing Environment

Train personnel to recognize changes in fresh concrete properties and how this may affect final finish in corners.

“The slump is very important since it will



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dictate the flow and workability of the concrete,” Marin said. “Too dry causes bugholes and honeycomb. Too wet causes the materials to separate from each other and result in leakage or unconsolidated concrete.”

Also, keep close watch on concrete and ambient temperatures. Keep form temperatures as close to concrete temperatures as possible. During colder months, move forms inside the night before they are to be used so the form temperature can acclimate.

► Prepour and Postpour Inspections

The key to identifying and preventing edge and corner finish issues are the prepour and postpour inspections. During the prepour inspection, make sure to:

- **Check for gaps at form joints.** Check for hardened concrete debris left from a previous pour that might block full closure.
- **Check form release application or accumulation in corners and bottom edges.** Look for form release leaking out of forms.
- **Check to make sure clasps and latches are fully closed and there are no loose parts.**
- **Remedy any of the instances listed above prior to pouring.** The postpour inspections are critical in identifying and diagnosing these edge issues. When a rough edge or corner is found, immediately:
- **Mark it for repair or disposal if applicable.**

- **Photograph the imperfection** – up close and farther back – for reference as to where on the structure it occurred. Use a coin or something else to show scale at close-ups.
- **Identify what date the structure was cast.**
- **Identify what form the structure was cast in.** If unknown, inspect all forms used that day. Ideally, paperwork accompanying the structure identifies a form number and orientation within that form that will drastically simplify the investigation. If known, locate the form and mark it for immediate inspection and repair, or remove it from production.
- **Closely examine the imperfection.** Check for staining, bug holes including their size and shape, larger voids and honeycombing, presence of mortar around larger aggregates and proximity of those larger aggregates. (See Diagnosis Guide in Table 1)

No matter the end use, the precast product is a reflection of a commitment to quality. Ugly, rough corners on structures may lead some to believe that a facility is cutting corners on commitment to quality. This is why the NPCA Quality Control Manual requires that every piece of formwork is inspected on an annual basis. If the measurements or squareness are out of tolerance, the form must be taken out of production until it can be fixed.

The commitment to mitigating these imperfections can involve a lot of work but will more than pay for itself down the road. ■

Claude Goguen is director of outreach and technical education at NPCA.

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ANTIMICROBIAL ADMIXTURES

Used in Concrete to Mitigate Microbially Induced Corrosion of Concrete (MICC)

By Sam Lines

Concrete is one of the most economic and widely used building materials in the world. Its strength and durability, along with its ability to be molded into almost any shape, make concrete a leading construction material of choice for designers.

Still, concrete occasionally can deteriorate as a result of contact with chemicals, minerals and environmental conditions. Deterioration mechanisms include damage from freezing and thawing, salt attack and carbonation, among others.

One cause of deterioration is microbially induced corrosion of concrete (MICC).

STUDY OF MICC

The root cause of MICC is well documented. After World War II, C.D. Parker discovered that a sulfur oxidizing bacterium - *Acidithiobacillus thiooxidans* - was used in converting hydrogen sulfide gas into sulfuric acid, and he wrote about it in "The Corrosion of Concrete."

Parker originally called this bacterium "*Thiobacillus concretivorus*," because it appeared to "eat" the concrete. The acid attacks concrete, causing the surface to erode or "corrode" (not to be confused with reinforcing steel corrosion).

Acidithiobacillus thiooxidans is the primary bacteria that causes

MICC in pipes in sewer systems¹. These bacteria live in very low pH environments, around 2-4. For reference, concrete generally has a pH of 12-13. The high initial pH of new concrete provides a period of immunity to most bacterial growth. As concrete surface pH is lowered by carbonation and sewer gases, it becomes more hospitable to hosting bacterial colonies.

THE THREE PHASES OF CORROSION

Based on work by Islander, et.al.², and confirmed by House³, there are three distinct phases of the corrosion process (see Figure 1).

Phase 1 is carbonation of the concrete, a naturally occurring process. With a pH of 12-13, concrete is very alkaline. Pure water has a pH of around 7, and acids have a very low pH. Acids react with the calcium hydroxide (CH) and calcium silicate hydrate (CSH) concrete constituents that provide this high alkalinity. Carbon dioxide, thiosulphuric acid and other mild acids abiotically reduce the concrete pH to around 9. This process can take months, or even years, depending on the concrete quality.

Phase 2 is the biological attachment phase. At pH 9, acid-producing bacteria of other species – for example, *Thiomonas intermedia*, *Halothiobacillus neapolitanus* and *Thiobacillus thioautotrophicus* – begin to colonize. These bacteria convert hydrogen sulfide into sulfuric acid. The weak sulfuric acid produced by this strain lowers the concrete pH until the bacteria dies off and another strain colonizes. Each strain of aerobic thiobacillus produces a stronger sulfuric acid than the previous one. Sand and Bock⁴ as well as Cho and Mori⁵ state that these neutrophilic sulfur oxidizing bacteria (NSOB) are required for *Acidithiobacillus thiooxidans* to colonize.

Phase 3 is the acid corrosion phase. *Acidithiobacillus thiooxidans*, an acidophilic sulfur oxidizing bacteria (ASOB), produces a strong sulfuric acid, rapidly deteriorating the concrete. Under extreme conditions of high hydrogen sulfide gas concentrations above the wastewater liquid level, concrete structures can lose up to a half inch (12mm) of mass annually during Phase 3. It can take as little as two to three years or as long as 10 to 15 years for this chain of events to reach this level of destruction, depending on concrete quality and sewer conditions.

HIGH QUALITY CONCRETE IS FIRST LINE OF DEFENSE

In a harsh environment exposed to sulfates, chlorides or acids, it is important to use a high-quality concrete mix with a low water-to-cement ratio (w/c). According to the Portland Cement Association (PCA) book, “Design and Control of Concrete Mixtures,” “Decreased permeability improves concrete’s resistance to freezing and thawing, re-saturation, sulfate, and chloride-ion penetration, and other chemical attack.”

It is important to reduce concrete permeability to increase durability. A w/c of 0.45 is good for most concrete products that are not exposed to harsh conditions. If there is a potential that the concrete will be exposed to harsh conditions, the w/c should not exceed 0.40.

In addition to a low w/c, the use of pozzolanic and secondary cementitious materials (SCMs) can increase the concrete density and lower concrete permeability. Fly ash, slag and silica fume are options. Using one or more of these mineral admixtures in the concrete mix design can increase the concrete strength and density while lowering the porosity and improving chemical resistance.

Promising work with nanomaterials also indicates significant permeability reductions with additives such as colloidal silica. Colloidal silica-based admixtures used in concrete have reported increased compressive and flexural strengths in addition to reduced permeability of water under high hydrostatic pressure. They also are known to reduce bleed water channels in hardened concrete.

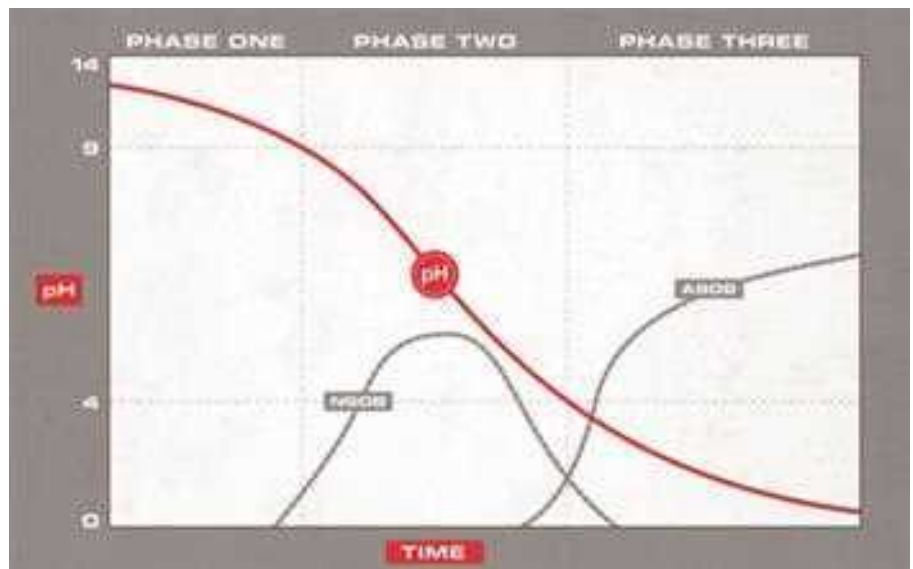


Figure 1. Concrete deterioration is a three stage process. Corrosion occurs in the latter part of Phase 3.

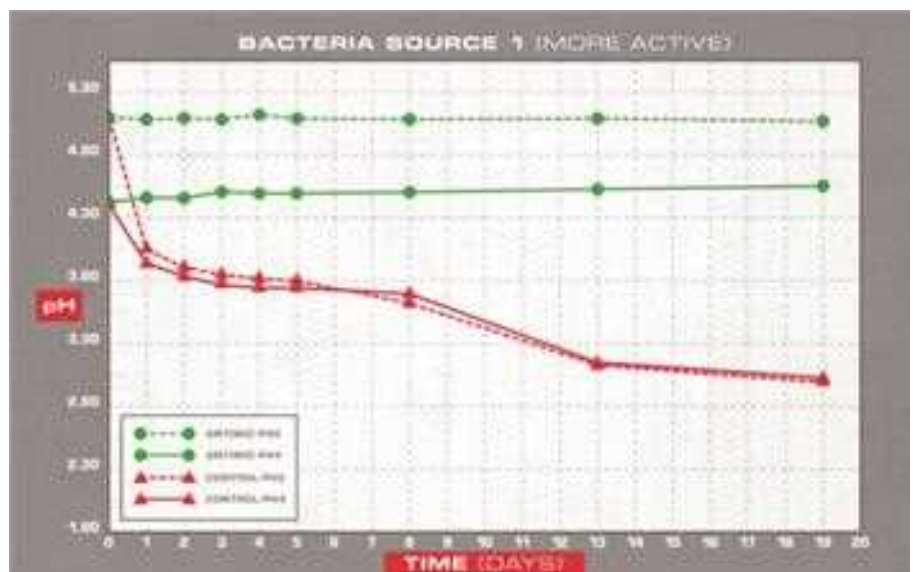


Figure 2. ASTM C1904 can validate that an antimicrobial admixture is effective at inhibiting bacteria.

ANTIMICROBIAL ADMIXTURES

While concrete densification is important to increasing a concrete structure's life, it will not stop the biological process that allows *Thiobacillus* bacteria to colonize. Antimicrobial concrete admixtures and surface-applied antimicrobial sealers are effective at reducing the effects of MICC⁶. Antimicrobial admixtures and sealers render the concrete uninhabitable to the growth and colonization of the neutrophilic bacteria in Phase 2, thus breaking the chain of events leading to acidophilic bacteria and Phase 3 of the MICC process.

Antimicrobial concrete admixtures are available in powder and liquid form. Regardless of the material type, any material that is marketed as a product preservative and labeled as an antimicrobial is considered a pesticide under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Precast manufacturers should verify that any product they purchase has a U.S. EPA registration number when sold in the United States. Registration in the country of import may be required when the product is sold outside of the United States. Additionally, each U.S. state requires registration for all pesticides sold and shipped into the specific state. If the pesticide is used as a material preservative (e.g., when the antimicrobial is added to the concrete), the treated article does not usually need to be registered. This is called the "treated article exemption."

Antimicrobial concrete admixtures are classified as Type S under ASTM C494, "Standard Specification for Chemical Admixtures for Concrete," which is applicable to both liquid and non-liquid concrete admixtures.

Section 2.1.5 of the NPCA Quality Control Manual states that: "Admixtures shall be products from manufacturers from whom test data are available to establish their effects on concrete and compatibility with other materials in the mix." Certificates of conformance for chemical admixtures need to be provided from the product distributor or manufacturer and must be updated annually.

Batching an admixture into a concrete mix will depend on the type of product and the volume being used. If the admixture is a liquid, the dosage is in ounces per 100 pounds of cement, also referred to as CWT or in gallons per cubic yard. A dry powder is dosed by weight as a percent of cement content. A liquid also can be batched as a percent by weight if the specific weight of the admixture is known.

When batching a liquid, the amount can be measured manually or automatically and added to the batch during the part of the batch cycle recommended by the admixture supplier. Most powdered admixtures used for MICC protection are batched manually. A dry material can be supplied in a water-soluble bag with a pre-measured volume for one yard of concrete.

Antimicrobial admixtures in concrete are intended to stop the transition of the MICC process in Phase 2. They typically are not effective in preventing corrosion from chemical attacks such as sulfuric acid immersion.

A concrete densifier may provide some protection at a pH as low as 2 or 3. The appropriate test method for assuring the efficacy of the product is a bacterial colonization test (ISO 22196 – Measurement Of Antibacterial Activity On Plastics And Other Non-Porous Surfaces, modified for concrete) or a biogenic acid immersion test (ASTM C1904 – Standard Test Methods for Determination of the Effects of Biogenic Acidification on Concrete Antimicrobial Additives and/or Concrete Products).

The modified ISO 22196 test first creates a condition in which bacteria grow and survive. As developed by Situ Biosciences, the concrete is first carbonated to having a surface pH of 6.0 to 6.5. At this pH, two of the predominate NSOB grow and multiply on reference concrete. A successful antimicrobial admixture results in a reduction in the bacteria count from the initial colony forming units (CFU) applied to the sample in contrast to the significant multiplication in bacteria count on the reference sample. This test can take three to six months to run.

ASTM Subcommittee C13.03 – Determining the Effects of Biogenic Sulfuric Acid on Concrete Pipe and Structures developed a simple, safe and realistic test for antimicrobial admixtures and for alternative concrete mix designs. ASTM C1904-20 is a test method for the effectiveness of determination of the results of biogenic acidification on concrete products and/or efficacy of antimicrobial products to resist microbially-induced corrosion (MIC) of concrete. This test builds on research and test methods developed during the past few decades to accelerate the process of MICC for product evaluations.

ASTM C1904-20 is a test method for the effectiveness of determination of the results of biogenic acidification on concrete products and/or efficacy of antimicrobial products to resist microbially-induced corrosion (MIC) of concrete.

The standard has three methods to use depending on the additive being tested.

- **Method A** is used to test the efficacy of liquid antimicrobial admixtures (See Figure 2).
- **Method B** is a biogenic acid immersion test of a mortar wafer containing an antimicrobial admixture.
- **Method C** is a phase three acid immersion test of a mortar wafer using ASOB to create the acidic conditions.

In addition to research by NPCA and ASTM, MICC is now a topic of discussion in American Concrete Institute (ACI) Committee 201 on Durability. This committee has formed a task group with a goal of developing a chapter on MICC for its ACI 201.2R Guide to Durable Concrete. The committee has representatives from around the world bringing new research and information to the industry.

Virtually every material has a mechanism by which it can be damaged. Having the knowledge and understanding of MICC is useful in designing products using concrete that will outlast our lifetimes. Solutions are available to protect concrete and/or reduce the risk of MICC in sewerage infrastructure products. **PI**

Sam Lines is the engineering manager at Concrete Sealants Inc.

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The Benefits of Joining ASTM

Quickly and easily have a say in the standards your company uses every day.

By Daryl Burns, P.E.

Products ranging from ski helmets to ink pens to precast concrete all have something in common. They are manufactured in accordance with standards set by the American Society for Testing and Materials (ASTM).

ASTM was founded in 1898 by Charles B. Dudley, Ph.D., a chemist with the Pennsylvania Railroad. In 2001, the organization became ASTM International to more accurately reflect its reach and impact.



NPCA file photo

ASTM committees C09, C13 and C27 have the most direct impact on policies that affect the precast concrete industry.



NPCA file photo

ASTM committees meet up to three times throughout the year along with votes and brief updates provided online.

Located in West Conshohocken, Pa., with offices in Belgium, Canada, China, Peru and Washington, ASTM International is a globally recognized leader in the development and delivery of voluntary consensus standards. Today, more than 12,000 ASTM standards in place around the world improve product quality, enhance health and safety, strengthen market access and build consumer confidence.

Developed, written and approved by ASTM committees, these consensus standards set the expectations for how facilities produce, store and ship products.

All ASTM members are eligible for these committees, which means you or members of your company can contribute to the standards that your organization operates by.

So, the question is: What are you waiting for?

ADDING YOUR VOICE

The three ASTM committees that have the most significant, direct impact on the precast concrete industry are:

- **ASTM C09** on Concrete and Concrete Aggregates, which oversees cement, aggregates and chemical admixtures, among other topics.
- **ASTM C13** on Concrete Pipe, which addresses reinforced precast concrete pipe, box culvert and manholes.
- **ASTM C27** on Precast Concrete Products, which oversees all other precast concrete products and various test methods.



"You really can do good for the industry while experiencing different perspectives and learning about the issues that others are having."

Hugh Martin,
Oldcastle Infrastructure

Additionally, each committee consists of various subcommittees that have specific focuses on a product, material or activity within the committee's scope.

For \$75 a year, ASTM members get a free volume of ASTM Standards. This alone is a great value. Separately buying the more than 125 equivalent standards related to precast concrete would cost thousands of dollars.

But that initial membership is just the start. Producers and suppliers benefit most from ASTM membership through joining the ASTM C09, C13 and C27 main committees and lending their voices to the decisions. Being a committee member is an opportunity to guide industry standard development and direct how precast products are designed and manufactured.

AVAILABLE COMMITTEES

Here is a listing of the main committees and subcommittees. Consider joining the main committee (C09, C13 or C27) and each subcommittee that is pertinent to your company's product or service offerings.

ASTM COMMITTEE C09 ON CONCRETE AND CONCRETE AGGREGATES

(MAIN COMMITTEE)

ASTM C09 subcommittees:

- C09.20 Aggregates
- C09.21 Lightweight Aggregates and Concrete
- C09.22 Materials Applied to New Concrete Surfaces
- C09.23 Chemical Admixtures
 - C09.23.01 Setting Time
 - C09.23.02 Air-Entraining Admixtures
 - C09.23.03 Chemical Admixtures
 - C09.23.04 Durability Enhancing Admixtures
- C09.23.05 Pigments for Integrally Colored Concrete
- C09.23.07 Chemical Admixtures for Segregation Resistance
- C09.24 Supplementary Cementitious Materials
- C09.25 Organic Materials for Bonding
- C09.27 Slag Cement
- C09.40 Ready-Mixed Concrete
- C09.41 Hydraulic Cement Grouts
- C09.42 Fiber-Reinforced Concrete
- C09.43 Packaged Dry Combined Materials
- C09.44 Polymer-Modified Concrete and Mortars
- C09.45 Roller-Compacted Concrete
- C09.46 Shotcrete
- C09.47 Self-Consolidating Concrete
- C09.48 Performance of Cementitious Materials and Admixture Combinations
- C09.49 Pervious Concrete
- C09.50 Aggregate Reactions in Concrete
- C09.60 Testing Fresh Concrete
- C09.61 Testing for Strength
- C09.62 Abrasion Testing
- C09.64 Nondestructive and In-Place Testing
- C09.65 Petrography
- C09.66 Concrete's Resistance to Fluid Penetration
- C09.67 Resistance to the Environment
- C09.68 Volume Change
- C09.69 Miscellaneous Tests

- C09.90 Executive
 - C09.90.01 Strategic Planning
- C09.91 Terminology
- C09.93 Symposia, Workshops and Research (Joint C09 and C01)
- C09.94 Evaluation of Data (Joint C09 and C01)
- C09.95 Coordination
- C09.96 Cement and Concrete Reference Laboratory (Joint C09 and C01)
- C09.97 Manual of Testing
- C09.98 Evaluation of Laboratories

ASTM COMMITTEE C13 ON CONCRETE PIPE

(MAIN COMMITTEE)

ASTM C13 subcommittees:

- C13.01 Non-Reinforced Concrete Sewer, Drain, and Irrigation Pipe
- C13.02 Reinforced Sewer and Culvert Pipe
- C13.03 Determining the Effects of Biogenic Sulfuric Acid on Concrete Pipe and Structures
- C13.04 Low Head Pressure Pipe
- C13.05 Special Projects
- C13.06 Manholes and Specials
- C13.07 Acceptance Specifications and Precast Concrete Box Sections
- C13.08 Joints for Precast Concrete Structures
- C13.09 Methods of Test
- C13.10 Correlation and Editorial

ASTM COMMITTEE C27 ON PRECAST CONCRETE PRODUCTS

(MAIN COMMITTEE)

ASTM C27 subcommittees:

- C27.10 Utility Structures
- C27.20 Architectural and Structural Products
- C27.30 Water and Wastewater Containers
- C27.40 Glass Fiber Reinforced Concrete
- C27.50 Terminology
- C27.60 Precast Autoclaved Aerated Concrete
- C27.70 Precast Concrete Products for Stormwater Management



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MEMBERSHIP TYPES AND BENEFITS

There are a wide variety of ASTM membership levels, all of which come with different benefits. Here's a look:

PARTICIPATING MEMBERS: \$75 per year

Benefits: *Direct committee participation, free volume of ASTM Standards, publication discounts, standardization news.*

ORGANIZATIONAL MEMBERSHIP: \$400 per year

Benefits: *Customized ASTM Organizational Member wall plaque, free listing in ASTM Membership Directory, transferable membership, direct committee participation, free volume of ASTM Standards, publication discounts and standardization news.*

INFORMATIONAL MEMBERSHIP: \$75 per year

Benefits: *Discount standards, standardization news.*

STUDENT MEMBERSHIP: Free

Benefits: *Scholarship opportunities, ASTM International eNews.*

Right now, those committees are populated primarily by engineers and academia who benefit from the men and women who work within the industry every day.

The C27 committee on Precast Concrete Products alone has openings for 70 producer members, according to Concrete Sealants Engineering Manager Sam Lines.

That leaves a lot of decision-making power to non-producer members who are deciding what is best for the design and manufacturing of precast products. By not engaging, precast industry members forfeit any recourse if they don't like changes.

MINIMAL TIME COMMITMENT

The time commitment for committee membership starts at 30 minutes per quarter, said Tom Elliott, manager of product design at Jensen Precast in Reno, Nev.

The bulk of that half-hour is spent considering and voting on ballot measures, which may not sound like much but is the No. 1 thing a precast producer or supplier can do to provide impact.

By rule, every "no" vote on a ballot measure must be discussed by the subcommittee and, if deemed persuasive, the ASTM Committee leadership must talk with the negative voter to seek possible solutions.

This is direct influence.

The benefits of being a committee member don't end there. ASTM committees are a great way to network, create a group of industry colleagues and learn the importance of standards.

"You really can do good for the industry while experiencing different perspectives and learning about the issues that others are having," said Hugh Martin, engineering manager at Oldcastle Infrastructure.

Becoming an ASTM committee member benefits not just you but the industry as a whole. And when not enough precasters populate a committee, critical voices are missing from what standards really mean in the day-to-day world. **PI**

Daryl Burns, P.E., is the director of codes and standards at NPCA.

HOW TO JOIN

After you consider the different membership levels and determine which is applicable, go to the ASTM website to sign up at the address below:

<https://www.astm.org/get-involved/membership>

For more information on how to join and the benefits of joining ASTM, email dburns@precast.org.

DERBY OF ONE

ALL crawler makes quick work of Louisville warehouses

In lattice boom crawler cranes, recent trends have been leaning toward bigger is better. But the smaller-but-mighty Link-Belt LS238HSL is demonstrating what it can do with a pair of precast construction jobs in Louisville, Kentucky. The 150-ton capacity crawler is building two warehouses in just one month, one 45,000 square feet, the other 50,000 square feet.

On rent from Central Rent-A-Crane of Indiana, a member of the ALL Family of Companies, to MVP Erectors, the LS238HSL is working on its own using a two-block setup. It allows the operator to pick each precast panel on two ends and rotate it into position in the air.

"We get hooked up, lift it, and tip it upright without touching the ground," said Roger Taylor, sales estimator for Central Rent-A-Crane.

Louisville has become a hub for warehouse and distribution centers, and Central's Link-Belt LS238HSL has become a popular crane for their construction.

"There is no need for teardown and reassembly between lifts," said Taylor. "We're able to simply glide along to the next position. It saves a ton of time for the customer."

Taylor estimates that each precast panel on the current job takes just

20 to 30 mins to pick and set. This includes unrigging the previous piece, rigging the current one, then flying, setting, and holding it for welding.

The crane works from a 40- to 45-foot radius with 130 feet of main boom. The precast panels weigh between 34,000 and 64,000 pounds. The operator has a clear field of vision and is working in a zone free from obstructions. Once he starts lifting the piece, he starts bringing the main line up to allow the piece to tip into the correct orientation. Simultaneously, he drops the load closer to the ground for safety.

The ground crew ties in tag lines and removes the rigging from the bottom of the piece then holds the bottom steady as the piece is lifted into position. Once in position, the crane holds it in place while welders join five points for a temporary hold, with a brace assisting to keep it in position until permanent connections are made.

"The process is repeated so fluidly, it's like a ballet," said Taylor.

Once the first warehouse is constructed, the crane will move on to the second. The crawler can walk over to the new site, as it is only approximately 200 feet away from the current site.

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NPCA file photo

The NPCA Certified Plant stamp provides a level of assurance for specifiers that the product meets the highest standards in the precast concrete industry.

NPCA Plant Certification

HAS BENEFITS IN THE PRIVATE SECTOR

By Chris Frederick

NPCA plant certification is recognized in 38 states and twice that many localities for work in the public domain, but there are distinct advantages in the private sector as well.

To qualify for certification, a precast plant must exceed a level of excellence defined by NPCA in accordance with industry standards in the NPCA Quality Control Manual for Precast Concrete Plants.

This takes a commitment to quality and an ability to raise the bar that is not lost on private contractors and engineering firms – as the more than 370 NPCA certified plants are finding.

Those processes and procedures give facilities an advantage when seeking work. Being able to stamp products with the “NPCA Certified Plant” mark gives specifiers peace of mind and provides plants a leg up through the bidding process.

Mike Worden of Concrete Systems Inc. in Hudson, N.H.,

understands this. Concrete Systems has been an NPCA Certified Plant since the program’s inception in 1987. Worden has seen the advantage that “NPCA Certified” not only brings with state DOTs but in private businesses as well.

Worden fully believes in the program benefits.

“Consistent quality throughout the industry with all members subscribing to the same high standards and following a common QA/QC program is highly important,” he said. “Being NPCA Certified instills confidence in the engineer, contractor and owner they are receiving a high-quality product that meets its expected design life.

“I have seen NPCA Plant Certification required in the private sector, not just on DOT projects. It provides credibility to all entities involved in construction of water, sewer, roads and heavy highway construction.”

Another longtime NPCA Certified Plant is Lindsay Precast in Alachua, Fla. Like Concrete Systems, Lindsay Precast can date its certification back to the program's inaugural year.

Lindsay Precast CEO Ron Lindsay said the advantage to being a NPCA Certified Plant pays for itself on DOT contracts and then pays it forward in gaining work beyond the public sector.

"We use it as a selling point to owners, specifiers and contractors, and it has been an effective marketing tool for years," Lindsay said.

Being NPCA Certified adds instant credibility, Lindsay said. Contractors may not know you personally, but they know NPCA and what its program stands for.

"Being NPCA Certified is very helpful when presenting an alternative product to other competing materials," Lindsay said. "It adds credibility in situations that specifiers might not be as familiar with the precast industry."

Every facility, whether certified or not, needs a QA/QC program in place to manufacture quality precast. The NPCA Plant Certification program provides the required guidance necessary to manufacture these products.

Whether you are currently participating in the Plant Certification program or are thinking about joining, it is important to remember to use Plant Certification as a selling point in every job you bid on.



Photo courtesy Concrete Systems Inc.

Whether a publicly funded bridge project or a small, private construction job, being NPCA certified is a nod to specifiers that the company puts its QA/QC processes above all else.

Being NPCA Certified is something to stand behind. It provides the support and credibility that can put a bid over the top – just as it has done for Concrete Systems and Lindsay Precast throughout the years.

PI

Chris Frederick is senior director of membership and regulatory services at NPCA.



Little Island, 267 Precise Pilings.

Project: Little Island@Pier55, a park on the Hudson River in NYC
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DEVELOPING A ROCK SOLID

Employee Handbook

Recruit, retain and energize employees by crafting and maintaining a high-quality handbook.

By Mason Nichols

First impressions often have a tremendous impact on establishing a bond.

This is especially true in business, where a company's success hinges not only on cultivating existing connections with clients but also fostering new relationships.

This strategy is just as important internally as it is externally. A workforce needs clear direction and expectations to function properly. As precast concrete manufacturers across the United States and Canada work diligently to attract new team members in the post-pandemic world, one vitally important tool can help pave the way to forging a strong, cohesive team: the employee handbook.

Along with setting baseline expectations for behavior, attendance and benefits, an employee handbook offers current and prospective team members an initial glance into company culture and operation. A legally compliant and thoroughly written employee handbook is not just helpful. It is necessary to function at maximum levels and nurture a high-performing team.

COVER THE BASICS

An employee handbook is more than a few pages thumbtacked to the bulletin board. It is a robust document.

According to Jamie Hasty, vice president at SESCO Management Consultants, the average handbook runs between 60 and 100 pages, sometimes even more.

"An employee handbook is the crux of every organization," she said. "What I find typically is that smaller organizations don't always have a formal employee handbook. And if they do, it's either very old and out of compliance or has been borrowed from someone else within the industry and may not apply to their respective state."

Avoid copying another company's handbook and instead look to develop your own. Start with some basic information that every handbook should contain. This includes sections covering a wide range of topics, such as:

- ▶ At-will employment (if this applies to your state).
- ▶ Equal employment opportunity (EEO).
- ▶ Harassment.
- ▶ Work hours.
- ▶ Leave under the Family Medical Leave Act (FMLA).
- ▶ Accommodations under the Americans with Disabilities Act (ADA).
- ▶ Workplace violence.
- ▶ Trade secrets and confidentiality of company information.
- ▶ Work rules and the consequences for violating them.

A handbook's specific legal requirements will vary depending on the state or states in which you operate. Because state and federal laws fluctuate, and because an employee handbook is a multi-layered, legally binding document, Hasty advises partnering with an employment attorney or a human resources consulting firm on the initial creation.

Ellen Bassett, vice president of human resources at South Carolina-based Tindall Corporation, must consider the company's multiple locations throughout the Southeast in the development and refinement of Tindall's handbook. This means specific policies for the company's Georgia location may not necessarily apply in Texas or South Carolina.

"We develop companywide programs here at the corporate headquarters that are passed to each of our business units," she said. "In some cases, we are able to establish policies that are universal,

"We want our new and current team members to always be reminded of our vision and purpose. We want them to walk in the door being proud to join our team. And we want them to grow with us."

Debbie McDonald, Gainey's Concrete Products

while in others, we may enact policies that are different based on state laws."

Because of the ever-evolving nature of employment law, a handbook should be reviewed annually for compliance – sometimes more often if a new law is enacted in your state, county or municipality.

THE BENEFITS OF A WELL-CRAFTED HANDBOOK

Taking the time to develop a compliant handbook is essential. However, providing an initial look at your organization's culture also is important.

With the average turnover rate for hourly workers in the U.S. precast industry at 54%, it is imperative that businesses deploy all the tools within their arsenal to help attract and retain employees.

At Tindall, Bassett's team publishes its handbook as part of a wider document that also includes the Tindall Operating Standards – or "TOPS." This all-encompassing piece includes the human resource policies that typically are found in a traditional employee handbook along with the company's values and a complete list of processes and procedures.

"Everything that's present within our handbook is meant to operate together," Bassett said. "We like to think by organizing it in this way, we have our whole group of values, policies and procedures that make us Tindall together in one place. They should all be considered collectively as a part of who we are."

The Tindall handbook is not a printed document. Rather, it is a digital piece that employees can access across any of the company's locations.

"The electronic interface provides quick access for our team members and helps create clarity and simplicity in how our policies are communicated," Bassett said. "It also makes things easier on us. We can ensure version control and know that whatever changes we make become immediately available to our team."

Just as employment law fluctuates from state-to-state, so too can the right approach to deploying an employee handbook.

At Gainey's Concrete Products in Holden, La., Human Resources Manager Debbie McDonald offers a paper copy of the handbook to employees on their first day. New team members also read through the entire handbook during their onboarding process.

Despite the difference in how the handbook is disseminated, the Gainey's approach shares one important thing in common with Tindall: communicating the company's values. This helps workforce members at both companies begin their careers with a deeper understanding of what to expect out of each day, ultimately leading to a more engaged, higher-performing group.

"Most of all, we want our new and current team members to always be reminded of our vision and purpose," McDonald said. "We want

them to walk in the door being proud to join our team. And we want them to grow with us.”

TIPS FOR SUCCESS

Precast concrete facilities create many of the same products, but the processes they use vary. Similarly, every employee handbook should follow the same basic roadmap but might take different routes to get there.

Along with engaging an employment attorney who possesses a deep knowledge of the policies required within your state, ask: “What do we value as a business?” and “What do we want our employees to know and understand about us?”

It is for these reasons that Hasty discourages the common practice of starting with an off-the-shelf handbook.

“What I find quite often is that people will have a handbook that they’ve pulled from Google,” she said. “This is not the correct approach. Having a poorly written piece – or one that’s out of date, as many that are pulled from the internet can be – actually can do you more harm than good.”

In addition to the overall annual review, consider examining sections for updates and enhancements at various points throughout the year. McDonald said Gainey’s assembles a focus group to tackle this effort.

“The focus group typically consists of our leadership team,” she said. “We’ll pick the handbook apart to determine what needs to be revised

and what can stand as is. After we tweak what we feel needs to be changed, we’ll then send it over to our labor attorney for approval.”

To help employees invest early on in the handbook, Bassett suggests strongly written verbiage with key pieces of communication listed toward the top of each section. She has found that this inspires team members to read with a more engaging eye and helps them better retain the information.

Paired with NPCA’s new Onboarding Program, which includes a comprehensive resource manual along with access to an expansive video library, a handbook gives new employees and existing team members the best foot forward toward sustained success.

THE BIG PAYOFF

The work done now toward a comprehensive employee handbook pays dividends down the road. It may seem an overwhelming task at first, but this important piece of company policy is worth its weight in gold when it is needed.

“What we find is, when there are solid policies and procedures along with a good orientation, structure and an empowered culture, you have a better outcome,” Hasty said. “There’s longer retention and recruitment along with more engaged and motivated employees.” **PI**

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

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Keeping CEMENT SILOS Safe and Operational

Cement silos present a wide array of risks for the precasters who operate them. Here's how to identify and address these risks before they become serious problems.

By Bridget McCrea

Reaching high into the air, concrete silos present unique safety challenges for employees who work in and around these massive structures. As a result, these buildings require special attention, particularly when it comes to overpressurization. Whether through neglect, poor equipment maintenance or excessive pressure input, overpressurization can lead to onsite hazards.

Falling, being struck by a falling object and inhaling cement dust are just some of the potential hazards associated with these structures. When not maintained and monitored properly, silos can literally “blow their tops,” leak powder or buckle – all of which can result in potential injuries.

DON'T IGNORE THE PROBLEM

To keep workers safe and their silos operational, precast concrete manufacturers must have the right equipment, pressure sensors, filters, pressure relief valves and safety procedures in place.

An unmonitored tanker that leads to a single discharge can create



NPCA file photo

“Precasters really need to have a game plan and a safety plan for operating in and around these structures.”

Keith Knox, *Knox Companies*

a serious problem. That’s why silo safety prevention is paramount – not just when something goes wrong.

“Many companies ignore silo safety until it becomes a problem,” said Keith Knox, vice president at Deland, Fla.-based Knox Companies. “Like when the top of the silo flows off or the baghouse (dust collector) blows up.”

Proper safety control valves are a major deterrence, especially when a top-heavy silo filled with cement requires human intervention to repair or clean.

“In the past, companies would send someone up to the top of the silo with a harness or lanyard that, when hooked to a rail, becomes an OSHA violation,” Knox said. “The only true and proper way to work at the top of a silo is using a horizontal lifeline kit with D-rings on it, for hooking the lanyard to.”

Even a short fall of a few feet can result in injury.

“Precasters really need to have a game plan and a safety plan for operating in and around these structures,” Knox said. “If there’s an incident, know in advance how you’re going to rectify it and make sure your workers are safe or, if they’ve been injured, how you’re going to get them down off of that silo.”

AN OUNCE OF CAUTION

According to OSHA’s website, the regulations governing proper silo usage are fairly basic and fall under the agency’s Safety and Health Regulations for Construction. For bulk cement storage, OSHA says any bulk storage bins, containers or silos shall be equipped with conical or tapered bottoms and either a mechanical or pneumatic means of starting the flow of material.¹

“No employee shall be permitted to enter storage facilities unless the ejection system has been shut down, locked out, and tagged to indicate that the ejection system is not to be operated,” OSHA states.

Control the pressure during deliveries and have the right people on hand to address any concerns early on.

Silo protection systems (SPSs) keep tabs on pressure sensors, emergency relief valves and other key indicators during the delivery process. These integrated safety systems control and monitor the pressure and level in a structure. Should a problem arise, the SPS also will take the required steps to prevent accidents or silo damage.

The maximum height of a typical cylindrical silo is 275 feet, according to a resource from the state of Oregon. Fatal accidents typically resulted from lack of proper equipment, including a proper harness or lanyard. In one 2013 incident in Ohio, a worker attempting to unclog a fly-ash silo without being properly harnessed fell and became engulfed.




NPCA file photo


Silos can rise hundreds of feet into the air, but even a fall from a few feet can lead to a twisted ankle or deep bruise that results in worker time loss.



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NPCA file photo

Specialized training helps in teaching employees how to properly scale and work around silos.

“Engulfment is one of the six major hazards present in silo-type storage facilities,” OSHA’s Bill Wilkerson said in a press release at the time. “This was a terrible, preventable tragedy that underscores the importance of complying with safety precautions. Employers are responsible for identifying hazards and ensuring workers follow proper procedures to prevent injury or death.”

Jim Mantz, a sales professional at Standley Batch Systems in Cape Girardeau, Mo., outlined some other silo safety concerns.

- **Overpressurization.** The worst-case scenarios of overpressurization are either a silo rupture or the filter unit being physically blown off the roof. “Both cause extensive disruption and loss of production, requiring costly repairs and equipment replacement,” Mantz said. Filters that often weigh more than 200 pounds each being disrupted cause additional damage when they land.
- **Damaged or faulty sensors.** Pressure sensors prevent silo overpressurization, detect pressures as low as 40 millibar (0.5 psi) and must be accurate and capable of operating in a low range. “In some cases, these sensors are ignored and/or not tested often enough,” Mantz said. “Alternately, they are tested by applying hand pressure to a sensitive rubber diaphragm, a force 50 times higher than the required set point.” Sensors fitted to silos must be fail-safe and suitable for the specific application.
- **Emissions released into the environment.** Overpressurization during the filling process can eject the powdered product into the atmosphere through the silo emergency pressure release valve (PRV) vent system. “Clouds of product blowing out during fills are indicative of silo protection failure,” Mantz said. Emitted corrosive or hazardous products that lead to environmental damage may result in large fines, expensive cleanups and negative publicity.
- **Falls.** In 2020, fall protection was the most frequently cited standards violated, according to OSHA. Working at heights requires care and training as well as equipment that only can be tested in situ. In other words, someone has to climb the silo before every delivery to perform a functionality test. “Even with correct safety gear, working at height requires great caution,” Mantz said. “In silos, all practicable steps should be taken to reduce the need to work at height.”

"In silos, all practicable steps should be taken to reduce the need to work at height."

Jim Mantz, *Standley Batch Systems*

AVOIDING RISKS

Knox advises precasters that he works with to check pressure relief valves and sensors regularly in order to ensure good operability. Something as simple as a device being clogged with cement dust, for example, will restrict its ability to do its job properly. Make sure the sensor area is ventilated properly and that dust isn't "blowing out" out the dust collector.

"If it's blowing dust," Knox said, "the chances are good that there's a clog somewhere."

For workers who ascend into the silo, make sure they are using proper fall protection, have been fit-tested for air breathing apparatus and are trained for working at heights.

"Twenty years ago, someone may have just tied a piece of rope around their waist and headed into the silo to fix the problem," Knox said. "Things have changed a lot since then. Now, companies that don't have the right certifications and safety equipment in place have no business trying to get in there." **PI**

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

REFERENCE:

1 OSHA standard 1926.702 (a) Bulk Cement Storage.



NPCA file photo

Proper training, maintenance and prevention are the best approaches to silo safety.



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Olson Precast Company

WORK HARD, PLAY HARD

By Joe Frollo / Photos courtesy of Olson Precast Company





What's life without a little fun?
That's a question Mike Olson doesn't want to know the answer to.

Don't get Olson wrong. As president and owner of Olson Precast Company, he has worked hard building an organization that now includes five facilities in three states.

But showing up for work each day at a precast concrete plant that overlooks the famous Las Vegas Strip makes a person understand there really is something to work-life balance.

Olson makes it a priority to carve out time in his schedule to follow his passions. He encourages and enables his staff to do the same.

The result has been a successful business model with steady growth and low turnover.

"In today's world, you can compensate people a lot of different ways," Olson said. "There's money, and that's important, but it's more than that. You give people responsibility and trust. You allow them to do their jobs and make decisions. And you let them live their lives and use their time away from work the way they want. That's really the key."

SETTING THE FOUNDATION FOR SUCCESS

Olson is a second-generation precaster and an entrepreneur. His father owned Arizona Precast Co. in Phoenix, where Olson worked summers throughout high school and while attending Arizona State University.

After graduating college, Olson went straight to work with his father, laboring in various areas to get an overall understanding of how the business operated.

"It was hard work, long hours," Olson said. "I went through every division and went from not having a clue to really knowing the ins and outs."

This was 1985 and, so far, sounds like the road many sons and daughters of precast take. But in 1989, Olson made a life-changing decision to leave his father's organization and begin exploring ways to start his own company from scratch.

On what seemed at the time like a whim but looking back feels like destiny, he drove 4½ hours northwest to meet a friend who recently set up shop as a contractor in Las Vegas.

After a few meetings and getting a lay of the land, Olson knew: This was it.

"We had the most beautiful, unadulterated view of the Strip looking across the valley. I still have great memories from that time. Those lights. Those sights. And year by year, it just kept growing and growing. And so did we."

Mike Olson *president and owner, Olson Precast Company*



Mike Olson (left) founded Olson Precast Company in 1989 with a \$50,000 line of credit and a handshake. Through the years, the company has grown to include facilities in Arizona and California as well as Ken "Dak" Spears (center) and Frankie Pelton.



The Olson Precast Company batch plant in Las Vegas was first constructed more than 20 years ago and continues to evolve to meet the company's needs.

"I went home and told my wife, 'Honey, we're going to Vegas,'" Olson said. "Two weeks later, I had a handshake deal with a ready-mix guy and a \$50,000 line of credit. I had a couple of guys, a boom truck and not much in the bank, but it was Las Vegas. Anything could happen. I never looked back."

A GROWTH OPPORTUNITY

The timing could not have been better – for Olson and his business venture. The Mirage opened in 1989, kicking off what is considered the "modern" era of Las Vegas hotels. With tropical landscapes, waterfalls and erupting volcanos, it set the stage for a string of high-priced, themed hotels along the Strip.

With contracts starting to come in almost right away, Olson and his crew stayed busy. Meanwhile, he was literally building his facility while helping build up the Strip.

During the day, his crews produced and installed sanitary and storm sewer manholes throughout the city. At night, the team returned to the shop to construct the plant. Olson Precast started out pouring ready-mix for the first three years while the batch plant machinery was purchased and assembled.

The long hours could be a grind, Olson said, but the aesthetics had no equal.

"We had the most beautiful, unadulterated view of the Strip looking across the valley," Olson said. "I still have great memories from that time. Those lights. Those sights. And year by year, it just kept growing and growing. And so did we."

Starting with the Mirage and continuing with the Luxor (1993), Excalibur (1995) and Mandalay Bay (1998), Olson Precast supplied manholes for the city along with drop inlets, catch basins, sewer pump stations, storm drain junction structures, French drain structures and other products for hotel construction.

Olson's big break came when a manhole contract expanded into a much larger opportunity with the Luxor. A local developer was unhappy with the pace of construction and turned to Olson for help. Olson believes two major factors played into the decision – the company's reliability and the fact that Olson Precast was the only union shop in the city.

"We signed a \$700,000 deal to build out the Luxor and, to be honest, that number doubled by the time the work was done," Olson said. "If you've ever seen how casinos are built, everything is a rush because every day they are not open, they are losing money. And the liquidated damages were huge. So, they put down the infrastructure to meet deadlines but then they drove over half of our drop inlets and we had to replace them."

"That is the job that really catapulted us. In the end, we've done much of the infrastructure, whether it's manholes, storm drain manholes, whatever, for every hotel on the Strip since 1991."

EXPANDING EAST AND WEST

With business booming at the Las Vegas site, Olson Precast soon began expanding.

Olson's first target was a precast operation in southern California in

“We’ve got a precast crew and a field crew, so we work hand-in-hand with everyone from the shop to the site. When you hire us, you get the complete package.”

Frankie Pelton *Olson Precast Company*

1999, located today in Rialto, Calif. Then came Olson Concrete Structures in Tuscon, Ariz., and most recently a production facility in Phoenix and a steel fabrication facility in Las Vegas called Tri-State Steel.

Olson already was spending about half of the year in Phoenix coaching high school football, so establishing plants there seemed a natural fit.

Each fall, Olson built his work schedule around the football season, balancing his two teams in much the same way.

“I found out early on – and this was emphasized for a lot of people during COVID – that I could do my job from anywhere as long as I had communication lines open,” Olson said. “If I could handle things by phone or the internet, we’d do that. If I needed to be in Vegas, I’d catch a 5 a.m. flight, check in with everyone, then be back out before noon to Phoenix.

“Whether it was football or construction, the key is finding people who can execute a plan and trust them to do so. Bosses don’t need to be hovering over everything if there is a good staff in place.”

Coaching and community involvement were important to Olson. They still are. He was an assistant coach for 20 years at three schools before taking over the Scottsdale Coronado High School program, where he turned around a struggling program to go 16-12 in his three years as head coach.

He continues to volunteer with a program called Young Life that brings athletics and ministry to inner-city kids.

“I made the time to enjoy my passion,” Olson said. “I do the same for the people who work here. If there’s something they want to explore – be it coaching or volunteering or even something like extreme sports – if adjusting their schedule doesn’t cause a conflict, we will find a way.”

LOYALTY WORKS BOTH WAYS

Dak Spears is an Olson vice president based out of the Las Vegas facility. He started as a union carpenter in 1998 and worked his way up from there, first as a project manager, then estimator and now his current position.

Spears said Olson sets the tone for how the company operates –



The equipment available at Olson Precast Company includes a 120-inch manhole base.



Olson Precast arch culverts, such as this example outside the Scottsdale Golf Club in Arizona, can be found throughout the southwestern United States.



A picturesque pedestrian overpass over Interstate 215 outside Las Vegas is not just functional. It also highlights the mountain view behind it.



Olson Precast constructed and installed these precast silo supports in Las Vegas.



There are more than 18 miles of sound walls running from the Las Vegas airport toward the cities of Henderson and Las Vegas, all constructed and installed by Olson Precast.

"I've found that if you treat people right – both your workers and your customers – things tend to work out well."

Mike Olson *president and owner, Olson Precast Company*

hardworking and fun. For Spears, that means getting up early every day, putting in a full day's work, then spending much of his free time building drag racers.

"I used to race when I was young, but then I got married and had a kid and had to put it aside," Spears said. "In 2003, I decided to tinker around and build a vehicle. Then another one. Then another one. I still race that first car, and it costs more than any prize money we earn, but I wouldn't give it up for the world."

As a carpenter, Spears worked short six- to 18-month contracts, many with the casinos. When a job ended, he'd go looking for another one. He took the job at Olson Precast to find some stability.

That's the same pattern Frankie Pelton followed. Starting in construction right out of high school, Pelton found himself with a steady flow of jobs and ability to set his own schedule.

After 20 years of that, Pelton met Olson and started talking. It took 20 minutes for Pelton to give up the nomadic life for a full-time gig.

"We were both coaching high school football, and we started out by talking about that," said Pelton, who has been the Las Vegas plant manager for the past three years. "I was at a point of my life where I felt stagnant. I had been doing the same jobs for two decades. Meeting Mike, I was ready for some new challenges, and I liked the way he approached things."

PROJECTS TO BE PROUD OF

Olson Precast not only produces the precast concrete products but installs them as well. Both Pelton and Spears like that start-to-finish aspect of the job.

"We've got a precast crew and a field crew, so we work hand-in-hand with everyone from the shop to the site," Pelton said. "When you hire us, you get the complete package. We don't subcontract anything out, and I think we do both things well."

As a result, Olson's stamp is found on many projects throughout the southwestern United States, including:

- The largest grease interceptor at the time under the Venetian hotel. At 150-feet-by-80-feet-by-12-feet, it holds 1 million gallons.
- More than 18 miles of sound wall from the Las Vegas airport toward the cities of Henderson and Las Vegas.
- A picturesque pedestrian overpass over Interstate 215 outside Las Vegas designed to highlight the mountain view behind it.
- The sewage pump stations and sewage ejector vaults for SoFi Stadium in Inglewood, Calif.; Allegiant Stadium, home of the Las Vegas Raiders; and the new Los Angeles Clippers stadium currently under construction.

“We are at a point where we build nearly everything to order,” Spears said. “We supply the electrical vaults for the local utility company, and those are going out every day. Specialty precast work, odd sizes ... we accommodate whatever a customer wants or needs.”

FOCUS ON CUSTOMER SERVICE

The companywide attention to customer service is what builds pride and loyalty, Spears said. Between that concerted effort and the union wages, Olson Precast has never had difficulty finding and retaining employees.

“I’ve found that if you treat people right – both your workers and your customers – things tend to work out well,” Olson said.

At the end of 2018, Olson sold 49 percent of the company to his employees to give them stock in the company’s success, adding another investment in personnel.

Olson also credits his coaching experience and how it translates to the business world. Being able to talk to people from different backgrounds and experiences is an asset when it comes to recruiting managers and seeking out new markets.

“You’ve got to be able to identify and acquire talent when it comes to the people who work in your organization,” Olson said. “It’s rare for someone to quit my company, but people retire or get an opportunity somewhere else, and you have to replace them.

“I expect a lot of my team members because they have sweat in the game. We love each other. We respect each other. And as a result, I’ve found I’m surrounded by nothing but the best people.” **PI**

Joe Frollo is director of communications and public affairs at NPCA.



The precast concrete walls that line the visitor center at the Hoover Dam were constructed and installed by Olson Precast.



Olson Precast’s California facility constructed and installed sewage pumps and sewage ejector vaults for SoFi Stadium in Inglewood, Calif., home of the Los Angeles Rams, Los Angeles Chargers and Super Bowl LVI.

INDUSTRY Influencers

GARY MUNKELT

Industry Influencers is a new series for *Precast Inc.* magazine in which we talk with people who are looked to for guidance and advice by NPCA members across generations.

By Heather Bremer

Photos courtesy Gary Munkelt & Associates

For this article, NPCA talked with Gary Munkelt of Gary K. Munkelt & Associates LLC. Gary, who was heavily involved in NPCA and ASTM and produced *The Precaster's Notebook*, died in March before the magazine was published.



Gary Munkelt

Q: How did you first get involved in the precast concrete industry?

A: I was working in the pharmaceutical industry, and I had one project that had a precast product on it. So once I got my master's degree, I started looking to get involved with the precast concrete products. My first exposure was H.C. Miller back in 1973. He's a precaster even today.

I started doing calculations for him. At that time, it was a

very new industry, and so we struggled a lot to do the designs because they were all new, not something you would find in textbooks.

I was let go from H.C. Miller in 1975. So, I bought a burial vault firm and got some experience of how precasting is really performed, much more so than just being the engineer. And that didn't turn out too well.

I had met Jack Ditcher in 1980, and he was a precaster in Atlantic Concrete Products. He was very active in not only the ASTM committees but also in the NPCA. I had joined ASTM back in 1974. Jack was very interested in it, and he was the main reason why I got into so much with NPCA and with the ASTM committees. He encouraged me to go to the ASTM committees, ASTM C27. And he also got me involved in things like ... I had to do a speech down in

Washington. I was really amazed. I'm standing up there giving a speech on precasting, and there's two little boxes with somebody in them. And one was translating my speech into Spanish and the other was translating it into German.

Q: How have you seen the industry change over the years?

A: Well, I haven't really seen a change. I've seen it grow because of the efforts of the committee members on the ASTM standards. The ASTM standards have been big benefit in terms of helping the industry convert people from the standard pour-in-place concrete. The ACI 318 is a document that is referenced by the standards for formulas but not for light cover. ACI 350 is something that was made for poured-in-place concrete. And so they're very, very overly conservative. They've recognized that they are and make a statement in the first page of their documents that the ASTM document prevails over the ACI 350, if the product is built that way. Now, the reason they were able to do that is that the industry, and this is all through NPCA. The industry has accepted this plant certification program, which involves inspections and coordination of how a record should be kept. So that's done a tremendous amount of helping the industry show that it's got a better product. I argue all the time with engineers who don't understand precast, and they are only used to poured-in-place documents, like ACI 318 and ACI 350. So with that, we have to keep fighting.

But that's the way the industry has improved. I have been so grateful to be part of it and see it grow. (Former NPCA President) Ty Gable, when he came on in 1994, did a tremendous job to help the industry along. I worked with him several times on projects to improve the industry.

I have written a precaster's notebook since 1991. I try to put a page out a month, and so it's gotten pretty thick now. But the idea there was to try to inform the engineers that are just coming out of college what precast is all about and how you go about designing the products. It's also helpful for precasters because there's material in there for conditions that they come upon in terms of problems in the field and problems in the yard. So, I've tried to help the industry in that respect, and so people have told me that I've been successful there.

Q: Your website biography describes your true love as writing and teaching. What makes you gravitate toward that?

A: You know, I often think about that, and the thing is that my biggest goal is to teach people. That's where The Precaster's Notebook comes in.

I did a lot of teaching at the NPCA shows. But I guess it's something that's in me. I almost ended up going into teaching altogether, teaching at the college level. But I had gotten married, and we had two children. It was too expensive to get a doctorate, so I ended up going into the precast world instead. So, I had an intuitive desire to do the teaching. I'm trying to do the teaching now for new people we have in the organization.



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Q: What lessons do you hope to pass along to younger members of the precast industry?

A: We had our holiday party about a month ago, and so I always have to give a speech at that. And what I was concentrating on was that they should know their product. In other words, make sure to do the research, whatever it takes, so that you understand how concrete is working. Just throwing a bunch of formulas together isn't gonna come up with the right answer every time.

The second thing I was trying to put out there was the problem with software. It's a great tool. It makes things go faster. But there are a lot of mistakes and errors in software, and you have to make sure the software is right. It's a matter of doing a check to make sure that the answers of the software are in the right ballpark.

The software scares me because there's too many people who won't bother to check the answer, and every once in a while there's been a problem. Sometimes people can't understand how to use it, and that's another problem, but it is concerning. So anyway, I have much desire to teach and help people.

Q: The precast industry has gotten a lot from you through your participation in various committees and within NPCA. What have you gotten out of the industry?

A: The biggest thing I can say is satisfaction. When I see a product go out with the design, and everything is hunky dory, I'm very satisfied that I've been able to have a part in the final product. It also satisfies me when I can find some engineers that turn around and understand what precast is all about.

Of course, I've gotten a whole life of involvement. It's all helped my family grow. But the biggest part is a satisfaction. Here I am 84 years old, and I'm still pumping out calculations. I had a real interesting problem this morning, and it's a real challenge, and I'll feel so good when I have found an answer for it.

Q: Where do you see the future of precast concrete?

A: I think there's a good future for it because the industry provides a big advantage for infrastructure for installing manholes and wet wells and bridges and buildings. They're all being made with precast to an advantage. They don't cost as much because of the speed in which they can be done because, well, it's just easier for the contractor. I see that continuing.

I see the engineering department at NPCA doing an awful lot out there to promote it, with good reason. It just gets more people to understand.

I had an interesting situation about six months ago, the state of South Dakota was very much against the precast product, specifically precast manholes. I got involved on a product that one of the precasters wanted to do. I hit up the head honcho of the engineering department, and in talking to him I was able to convince him by answering all of his questions, the concerns that he had and get them to understand precast. So once they did, they permitted this project to go through. The project went through so fast, and it was so easy to do, even the inspection department from the state was happy with everything. The state now builds precast into their specifications.

What they did was they discarded an old bridge, rerouted the traffic over the box culvert. They're going to have more products like that. I thought that one was really, really great as far as satisfaction. We were fortunate. We got a nice plaque out of that. That to me is the kind of thing that needs to be done ... precasters, precast engineers, NPCA all need to get to the people who make the decisions as to whether you go pour-in-place or precast. We've done a good job of that for the last 30, 40 years. And I think if we can keep it up in the future is gonna be great.

PI

Heather Bremer is the communications manager at NPCA.

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THE
**PRECAST
SHOW**



A RECORD-SETTING PRECAST SHOW IN KANSAS CITY

By Joe Frollo / NPCA photos by Heather Bremer, Joe Frollo and Marti Harrell

The precast concrete industry was on full display March 3-5 in Kansas City, Mo., as record-setting registration numbers and show floor space combined for an exciting and eventful Precast Show 2022.

More than 4,600 individuals registered for the 82,000-plus-square-foot show floor at the Kansas City Convention Center. Registration numbers and square footage both show the highest totals since the 2008 recession.

“What an exciting week for the industry,” NPCA President Fred Grubbe said. “The joy on people’s faces said it all as they gathered together, saw old friends and met new people.

“The feedback we got from exhibitors is that the show was not just well-attended, but active conversations led to both sales and potential business down the road. I believe everyone was eager to come to

Kansas City and return to business as normal.”

The exhibit hall was just one part of the larger event. With committee meetings, more than 100 hours of education sessions, area plant tours, 42 graduating Master Precasters and a final event at the historic Midland Theatre, The Precast Show 2022 had opportunities to experience and expound upon the industry nearly 24/7.

“I’m thrilled to be fully back face to face with my friends and precast family,” NPCA Chairman of the Board Mark Wieser said. “The Precast Show is the highlight of the year in our industry and a time to show the world who and what we are. I want to thank the exhibitors and Producer members, but I also want to commend Fred and the NPCA staff for all their hard work in making this a truly remarkable event. They set the bar really high for the years to come.”



More than 350 exhibits filled the Kansas City Convention Center during The Precast Show 2022. Conversations were lively throughout the three days of the show as precast industry professionals from across the globe gathered for the annual show.



Forty-two individuals earned their gold hard hats during The Precast Show 2022, completing Master Precaster education. They were celebrated and presented with their diplomas in front of a crowd of more than 500 friends and family.

HERE ARE SOME OF THE HIGHLIGHTS FROM THE WEEK:

An Industry on Display

The Precast Show floor included 361 booths covering 82,300 square feet.

With free food and drinks available at least parts of all three days, traffic remained high for most of the 14 hours.

Add to that: More than 30,000 Precast Show app page views, including 50 percent of those coming before the show, gave exhibitors a chance to share their products and services before people even began landing in Kansas City.

Thursday Awards and Keynote Lunch

The NPCA Keynote Luncheon Featuring Industry Awards and Graduation included 42 Master Precaster graduates and a special surprise for longtime Production Quality School instructor Mel Marshall. There also were certification anniversary awards, Best Practices Awards and a rousing keynote from Michael Hoffman.

Marshall became the third individual to be named an Honorary Master Precaster, joining Mark Thompson and Greg Chase.

Hoffman closed the event by challenging NPCA members to bring more energy to

their work lives, to train themselves to say “yes” more often and to truly treat coworkers as family.

Three Times the Fun on Plant Tours

Precast Show attendees and exhibitors had the chance to visit three Kansas City-area facilities as part of the Plant Tour program.

With stops at Forterra Pipe and Precast plants in Independence, Mo., and Bonner Springs, Kan., along with the PRETCH plant in Kansas City, Kan., visitors toured the facilities and examined ongoing projects.



Mel Marshall (left) received a surprise honor from NPCA Chairman Mark Wieser during the annual Keynote Luncheon. Marshall became just the third person to be named an honorary NPCA Master Precaster.



Precast Show Plant Tour participants had the option of going to one, two or three facilities based on their schedule. Twelve packed buses left the Kansas City Downtown Marriott starting at 6 a.m. to make the rounds.



Frank Robertson (center) won The Precast Show Prize Giveaway grand prize of \$5,000, capping a three-day total of more than \$10,000 in giveaways by NPCA during The Precast Show.

Prize Giveaways

Once again, NPCA gave away more than \$10,000 worth of prizes to 10 lucky visitors on the show floor. Ranging from an iPad to a tool kit to an outdoor fire pit, the Prize Patrol called out winners, who had 10 minutes to visit a designated booth and claim their rewards.

The grand prize winner of \$5,000 – given away on Saturday afternoon – was Frank Robertson of Paulding Precast/Specialty Concrete Products.

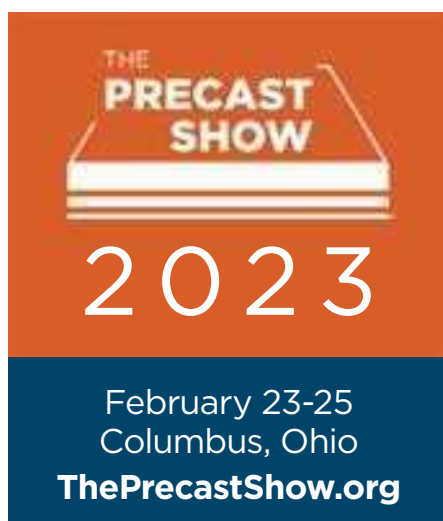
Closing with a Bang

More than 500 people attended The Precast Show Final Event at The Midland Theatre, a former 1920s speakeasy. Guests were entertained by a jazz band and an improv comedy troupe as they indulged in fine foods and open bars on multiple levels of the theater.

The event capped what was an exciting week of reverie and reunions. **PI**



More than 100 hours of education sessions were available at The Precast Show, covering everything from Precast 101 to the Production and Quality School courses that lead toward Master Precaster designation.



The Precast Show 2022 capped a fun three days with a party at the historic Midland Theatre.

2021 NPCA Best Practices Awards



Sponsored by:



The **Best Practices Awards** recognize a wide range of practices and products that aim to make the job easier, safer and more sustainable within a facility. NPCA congratulates all companies that participated and encourages both Producer and Associate members to keep the award in mind when making improvements throughout the year. Be on the lookout this fall when we begin collecting entries for the 2022 awards.



Photo courtesy of Smith-Midland

Smith-Midland Corp. used a soundwall wing pouring guide to eliminate spillage and make jobs more efficient, cutting down on the number of people and the amount of time needed to complete various tasks.

The NPCA Best Practices Awards recognize industry best practices and improvements that showcase the best way to do a job, treat the environment, improve safety, save money and more. The program honors the precast industry's sustainable, safety and lean manufacturing process innovations. The quality of the 2021 Best Practices Awards entries proves that NPCA Producer and Associate members are committed to manufacturing products in ways that improve life both inside and outside their plants. The entries were evaluated by the Engineering and Technology Committee, and the independent scores were tabulated to arrive at the following results:

1 First Place:
Smith-Midland Corp.
"Takt Time, Job Breakdown and Work Combination"



Throughout its ongoing mission to enhance efficiency and reduce waste, Smith-Midland has implemented numerous lean principles into its production process. In 2021, the manufacturing schedule for a new product initially called for five associates performing various tasks to complete six panels in two hours. This procedure included too much waste as defined by lean manufacturing principles. Instead, Smith-Midland applied tools called "Takt Time, Job Breakdown and Work Combination" to streamline the process.

Through analysis, Smith-Midland established "Takt Time," which is the available time divided by the customer demand of 20 minutes per panel. It then analyzed the "Job Breakdown" by timing the required tasks for each person and finding a total cycle time of 44 minutes. By dividing that by the Takt time of 20 minutes, Smith-Midland found it needed 2.2 people, rounded up to 3, to successfully complete the job. Finally, "Work Combination" is the result of analyzing the work sequencing and refining the process.

The result is the six required panels are manufactured in two hours using only three associates. This process resulted in 40% improved labor efficiency, reduced defects and engaged employees while creating a standard practice moving forward.

Takt Time:	
6	Panels
2	Available Hours
120	Available Minutes
20	Takt Time - Minutes per Panel

Job Breakdown:							
Steps	Work Element	Crane Worker 1 Minutes	Spreader A Worker 2 Minutes	Spreader B Worker 3 Minutes	Vibrate Worker 4 Minutes	Rake Worker 5 Minutes	Total
Step 1	Get Concrete						
Step 2	Pour Concrete	3.0	3.0	3.0	4.5		13.5
Step 3	Screed		0.5	0.5			1.0
Step 4	Rake 1					2.5	2.5
Step 5	Rake 2					2.5	2.5
Step 6	Pour Returns	6.0	6.0		1.5		13.5
Step 7	Finishing Return			5.0			5.0
Step 8	Remove Form		1.0	1.0			2.0
Step 9	Trowel				4.0		4.0
	Total	9.0	10.5	9.5	10.0	5.0	44.0

2 Second Place: National Precast "Rim Riser"



National Precast consistently seeks to facilitate product installation. As part of this mission, the company found that a challenge existed when adjusting at-grade precast concrete lids. Installers were required to utilize large equipment to lift the lids while using shims to make final adjustments. National Precast partnered with fellow NPCA member Rim Riser to install an engineered screw adjustment system that makes installation easier for its customers.

The system includes adjustable corrosive-resistant screws that enable installers to lift or lower lid corners using a screw gun and hex nut driver or a speed wrench. Once the top is set to the correct elevation and slope, the installer makes incremental adjustments to all screws to eliminate any remaining play or



NPCA file photo

Corrosive-resistant screws helped National Precast installers lift or lower lid corners more easily. Once the top is set to the correct elevation and slope, the installer makes incremental adjustments to all screws to eliminate any play or wobble.

wobble. The installer then packs the gap between the precast top slab and supporting base with local agency-approved, non-shrink grout, concrete or mortar.

The system is easily cast into the lids at the precast plants using reusable pocket formers that are removed to leave the screw system accessible. This enhances the product's functionality and eliminates waste associated with job-specific design and fabrication. It also enhances job site safety by requiring no heavy equipment or power tools to make grade adjustments.

Third Place:

3 Winchester Precast "Watts Water Flow"



Photo courtesy of Winchester Precast

Winchester Precast utilized its Watts Water Flow system to more efficiently create this 1500 mid-seam septic tank.

Winchester Precast is always on the lookout to implement new processes and programs to enhance product manufacturing efficiency. Often, these newly developed processes come as the result of careful analysis. Sometimes, however, necessity is the mother of invention. In this case, a specific predicament helped lead to the "Watts Water Flow" system.

While batching raw materials, the water flow meter started to miscount, so the batch plant operator began consulting the mixer wattage formula entered in the mixer program. When the slump or watts reached the preset amounts, he shut off the water. As a result, the mixes during the next days started to look better. Building on this, Winchester Precast integrated both systems in series they called the Watts Water Flow so the watts and the water meter prevented excessive water from being introduced into the mix.

The program monitors the fresh concrete flow by correlating the incoming grid voltage and motor amps for the specific mix design and shuts off the water before the flow/slump gets out of tolerance. This results in better fresh concrete consistency.

Winchester Precast estimates a 45% improvement in controlling extra water, beneficial in achieving consistency of slump within batches.

Winchester Precast has shared this programmed logic with other NPCA members to help them reduce fresh concrete variability and enhance their quality. **PI**



Working For You

IN 2022

Representing NPCA Members and the Precast Industry

Since January, NPCA has represented the industry at the following meetings, tradeshow and presentations in order to represent its members and promote precast concrete.



NPCA file photo

Industry Meetings

- **JAN. 9:** Transportation Research Board (Virtual)
- **JAN. 14:** TDOT Annual Precast Meeting (Nashville, Tenn.)
- **JAN. 25:** MDOT (Michigan) Annual Workshop (Virtual)
- **JAN. 27:** NPCA Bi-Annual DOT Meeting (Virtual)
- **FEB. 22-23:** NJ DOT Conference (Virtual)



NPCA file photo

NPCA Director of Outreach and Technical Education displays a cylinder that was tested for compressive strength as part of NPCA's booth demonstration during the 2022 WWETT Show in Indianapolis.

Tradeshows and Presentations

- **JAN. 12-13:** 2022 IOWWA Annual Conference (Des Moines, Iowa)
- **JAN. 17-20:** World of Concrete 2022 (Las Vegas, Nev.)
- **JAN. 18-19:** MSO Annual Conference (Columbia, Mo.)
- **JAN. 26-28:** NCSTA (Hickory, N.C.)
- **FEB. 7-8:** MOWA Annual Conference (Mankato, Minn.)
- **FEB. 9:** IOWPA (Indianapolis, Ind.)
- **FEB. 21-24:** WWETT Show (Indianapolis, Ind.)
- **MARCH 3-5:** The Precast Show (Kansas City, Mo.)
- **MARCH 6-9:** TOWA Conference (Galveston, Texas)
- **MARCH 13-15:** PASEO Annual Conference (Harrisburg, Pa.)
- **MARCH 15-16:** Purdue Road School (West Lafayette, Ind.)
- **MARCH 16:** Indiana State GGI Design Conference (Indianapolis, Ind.)
- **APRIL 5:** Purdue Senior Design class (West Lafayette, Ind.)
- **MAY 2-3:** PCAV Educational Conference (Richmond, Va.)

NPCA Foundation grants

The NPCA Foundation, in partnership with NPCA and the PCI Foundation, have funded five grants at universities across the United States, including New Jersey Institute of Technology, Middle Tennessee State University, Texas State University, California State University-Chico, Kansas State University and Idaho State University.

These grants are used to develop precast-specific curriculum for students in engineering, construction management, concrete industry management (CIM) and architecture programs. They will help develop the next generation of specifiers, contractors and industry workforce who are familiar with the many advantages of precast concrete.

The schools receiving these grants continuously look for industry speakers to share real-world experience with the students.

If you are located near these schools, consider connecting with the professors, or reach out to NPCA to introduce you to offer your experience for a guest lecture and/or to open your plant for a tour.

Engaging with the next generation builds long-term bonds that can pay dividends throughout these students' professional careers.



Photo courtesy of Kansas State University

An NPCA Foundation grant has helped develop precast concrete-specific curriculum at Kansas State University.

NPCA Bi-annual DOT Meeting

In January, NPCA held a bi-annual state DOT meeting to provide updates to NPCA's DOT partners about the NPCA Plant Certification program.

Thirty-six DOT personnel participated in the virtual meeting which reviewed changes for the 2022 NPCA Quality Control Manual, updates on entities recognizing NPCA Plant Certification, recaps of the Michigan DOT and Tennessee DOT annual meetings, and ongoing education opportunities for DOT personnel through NPCA.



Students and professors from California State-Chico (red) and New Jersey Institute of Technology (black) pose together following the 2022 NPCA Foundation Student Competition at The Precast Show 2022 in Kansas City. Also pictured is NPCA Foundation Chairman Aaron Ausen (back left).

NPCA Foundation Roundup

FROM THE PRECAST SHOW

By Joe Frollo / NPCA Photos by Heather Bremer, Joe Frollo and Marti Harrell

The NPCA Foundation introduces the benefits of precast concrete careers to engineering students through scholarships, grants and working directly with universities to develop courses and labs focused on the industry.

During The Precast Show 2022 in Kansas City, the Foundation brought together students and faculty from New Jersey Institute of Technology, California State University-Chico, University of Pittsburgh-

Johnstown, Kansas State University, McNeese State University and Idaho State University to offer educational, instructional and social opportunities.

CHICO WINS STUDENT COMPETITION

The NPCA Foundation's fourth annual Student Design Competition featured high quality analysis and presentations by the teams from Cal

State-Chico and NJIT.

Students were given a project for the SH 119 Underpass at Hover Street in Longmont, Colo. Student teams then tackled a scenario for plant production capability and presented their proposals that included all aspects of the box culvert underpass design, a QA/QC plan,

transportation and installation instructions to a panel of industry judges. The judges were Andy Hayward of Panhandle Concrete Products, Magda Muka of Titan 3000 Precast Management System, Alex Burkhart of Smith-Midland Corp and Daryl Burns of NPCA. The project was provided by Panhandle Concrete Products.

Following the presentations, Hayward presented the solution that ultimately was used by his company to complete the project.

Cal State-Chico won and received \$5,000 for its school's program and \$2,000 for the student team to share. Chico team members were Bryson Bowen, Eric Bermudez, Zack Corral, Aiyana Ruby Santillan, Nick Cervelli and Yanetli Navarro.

NJIT received \$4,000 for its school's program and \$1,200 for the team to share.

Look for the 2023 problem statement later this spring, and encourage students in your community to get involved. If your company has a project that would be good for a student competition challenge, contact Marti Harrell at mharrell@precast.org.

SILENT AUCTION SETS RECORD

The 10th annual NPCA Foundation/PCI Foundation Silent Auction was a record-breaker in terms of donated items and winning bid totals thanks to the generosity of donors and bidders alike. The Silent Auction raised \$81,769, which will benefit the missions of the NPCA Foundation and PCI Foundation.

NPCA staff has contacted donors and winners to finalize the details of items shipments. If you have not received your item, contact Marti Harrell at mharrell@precast.org.


Start thinking about your donation ideas for the 2023 auction at The Precast Show in Columbus, Ohio.

FOUNDATION BOARD MEETING

The NPCA Foundation Board of Directors meeting at The Precast Show included reports from five universities that have received grants from the Foundation and NPCA. These schools included NJIT, Idaho State, McNeese State, Cal State-Chico and Kansas State. With the grants provided by the Foundation and NPCA, these universities have created precast-specific curriculum and labs for undergraduate and graduate students in construction management, engineering, architecture and concrete industry management.

The NPCA Foundation also is working with faculty at each of these schools to explore avenues to share their curriculum with other schools and to create certificate programs for concrete technicians.

Want to know more or get information about these programs with your local university or vocational school? Contact Foundation Executive Director Marti Harrell at mharrell@precast.org. **PI**



Members of the New Jersey Institute of Technology team (left) and Cal State-Chico team (right).



NPCA Foundation Chairman Aaron Ausen gave the state of the foundation during the Keynote Luncheon at The Precast Show 2022.



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PEOPLE & PRODUCTS

People & Products is a forum where NPCA members and nonprofit organizations can share information on new products, personnel promotions, acquisitions or service announcements concerning the precast concrete industry. Items are printed on a space-available basis.

For possible inclusion, send your press releases and photos to jfrollo@precast.org.

TINDALL PROMOTES THREE TO SENIOR VP POSITIONS

Tindall Corporation is reorganizing to become two distinct business groups: Tindall Building Systems Group and Tindall Infrastructure Group. As part of this, Tindall has promoted Cheryl Lang to senior vice president of administration, Rob Smith to senior vice president of operations of the Building Systems Group and Joel Sheets to senior vice president of operations of the Infrastructure Group.



Cheryl Lang

accounting and finance, human resources, safety, trucking, information technology and marketing.



Rob Smith

residential, commercial, institutional, manufacturing and warehouse/distribution market segments, bringing engineered precast solutions to its customer base.

Sheets joined the Tindall team in 2002,

Lang joined Tindall in 1990 as a controller. In 2006, she was named vice president and CFO. As senior vice president of administration, her duties include oversight of

Smith started as an industrial engineer with Tindall in 2004. As senior vice president of operations, he will lead strategic business planning and implementation for the company's



Joel Sheets

the division in 2008. As senior vice president of operations, he will continue to lead the team that brings innovative solutions built on speed and quality to the southeast market as well as explore opportunities to expand Tindall's infrastructure footprint beyond the new flagship plant that opened in 2021.

Sheets serves as the chair-elect of the NPCA Board of Directors.

Tindall also named the following



Clancy Self



Michelle Gneisig

serving as senior project manager for the South Carolina Prestress Division and subsequently serving in several roles with the Utility team until he was appointed as general manager of

the division in 2008. As senior vice president of operations, he will continue to lead the team that brings innovative solutions built on speed and quality to the southeast market as well as explore opportunities to expand Tindall's infrastructure footprint beyond the new flagship plant that opened in 2021.

Sheets serves as the chair-elect of the NPCA Board of Directors.

individuals to its leadership teams:

Clancy Self is now chief financial officer. Self joined Tindall as a process engineer in 1996 and will oversee the company's financial health.

A member of the Tindall team since 1998, Michelle Gneisig as comptroller will supervise accounting and closely monitor the company's financial health.



Isaac Perkins

Georgia Division, Perkins is responsible for overseeing all operations of the division, including estimating, sales, purchasing, project management, shipping, erection and professional development of the Georgia team.



Greg Elliott

of the Texas division, he is responsible for overseeing all operations of the division, including estimating, sales, purchasing, project management, shipping, erection and professional development of that team.

Isaac Perkins joined Tindall as a process engineer in 2004, eventually working his way up to plant manager. Now, as vice president and general manager of the

Greg Elliott joined Tindall's Texas Division in 2013 and has since held several manager positions within the company. As vice president and general manager

DAWES NAMES HOOPS AS MINNESOTA SALES REP

Dawes Rigging & Crane Rental, a member of the ALL Family of Companies, named Terry Hoops its territory sales representative for Minnesota. Hoops oversees Dawes' bare and operated rentals as well as all equipment



Terry Hoops

sales covering the entire state.

Hoops has three decades of experience in equipment sales, developing deep relationships within key markets that rely on heavy lift

equipment. For the previous 13 years, he sold boom trucks and was key in updates made to the Manitex 30112S model to make it more suitable for use in the roofing market.

COMBLIFT HONORED BY AUSTRIAN PUBLICATION

Holzkurier, an Austrian publication for the timber sector, named Comblift as its Timber Trade Supplier of the Year for 2022. The company's product development, growth in the Austrian market and customer service were among reasons cited by the editorial panel.

Comblift delivered its first truck to Austria in 2003, when a customer from the timber sector purchased one of the original C-Series multidirectional models. Since 2018, Gregor Kramar has held the position of Comblift's

Austrian Country Manager and has overseen the steady growth of the dealer network and the expansion of the customer base.

For the last few years Comblift's incoming orders have recorded double-digit growth rates in German-speaking countries and sales of more than €4 million were generated in Austria last year.

ASCC ELECTS NEW OFFICERS



Chris Klemaske

Chris Klemaske, Sundek National Accounts, Grand Prairie, Texas, has been elected first vice president of the American Society of Concrete Contractors (ASCC).

Elected vice presidents were Paul Albanelli, Albanelli Cement Contractors; Cory Lee, Martin Concrete; and Maizer Oujidani, Conco. Aaron Gregory, Gregory Construction, was elected treasurer.

Heather Brown, MTSU; Peter Emmons, STRUCTURAL; and Keith Wayne, Wayne Brothers Companies, were re-elected directors.

Newly elected directors are Greg Hryniewicz, Hyde Concrete; T.R. Kunesh, Somero Enterprises; Marc Ness, DPR Construction; and Ashley Stamper, DANKO Concrete Construction.

MAX USA HONORS TOP EMPLOYEES

MAX USA recently announced the following internal awards for the final six months of 2021:

- Best Territory Sales Growth: Mike Laudenbach
- Best Region Sales Growth Award: North Midwest Region, James Sullivan
- Best Salesman, second half: Brett Miller
- Customer Service Award, third quarter: Prabhleen Kaur
- Customer Service Award, fourth quarter: Diana Zorovich
- Best Staff Employee: Susan Tempesta
- Best Japanese employee: Shin Kanda

PI

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LTM CONCRETE

CALENDAR OF EVENTS



Nov. 3-5, 2022
NPCA 57TH ANNUAL CONVENTION
Omni Amelia Island Resort
Amelia Island, Fla.



Feb. 23-25, 2023
THE PRECAST SHOW 2023
Greater Columbus Convention Center
Columbus, Ohio



Oct. 12-14, 2023
NPCA 58TH ANNUAL CONVENTION
Omni Oklahoma City Hotel
Oklahoma City, Okla.



Feb. 8-10, 2024
THE PRECAST SHOW 2024
Colorado Convention Center
Denver, Colo.



For the most up-to-date
information about NPCA events,
visit precast.org/meetings

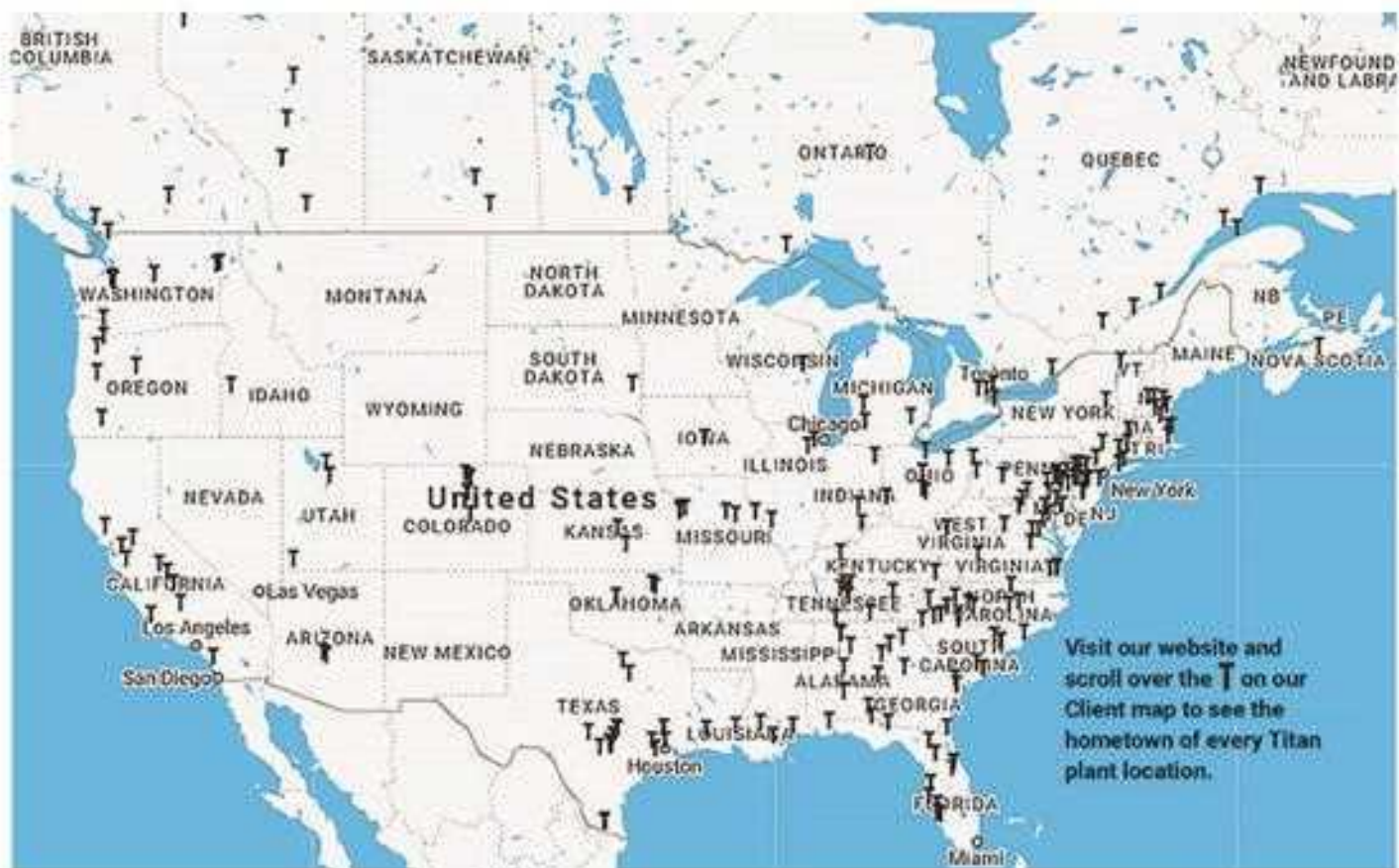
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From Sea to Shining Sea!



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