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Q2 2021



PUSHING THE ENVELOPE

30 MBO Precast emphasizes quality, customer service and never backing down to carve a niche in the Northeast.

On the Cover:
MBO's 2021 Western Star 4700 and PM 65024 Knuckle Boom is one of the newest additions to the Massachusetts company's fleet.

Photo courtesy of MBO Precast.

CHAIRMAN'S INSIGHTS

5 A Message from NPCA Chairman Ron Sparks

TECHNICALLY SPEAKING

- 6** Questions from the Field
- 8** Best Practices for Preformed Flexible Joint Sealant
- 14** Double Pouring: What You Need to Know to Make It Work
- 18** How to Talk to End Users About Repairs and Surface Imperfections

MANAGEMENT

- 22** Dialogue Education: A Concrete Method of Adult Training
- 26** Setting Up New Employees for Success

THEN & NOW

38 Gainey's Concrete Products

SAFETY

44 Tools for Establishing a Strong Safety Culture

WORKING FOR YOU

48 Continuous Improvement In a Virtual World

FOUNDATION NEWS

50 Idaho State Sets a Concrete Foundation for the Future

INDUSTRY NEWS

- 52** Best Practices Awards
- 56** People and Products

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CHAIRMAN'S INSIGHTS

A Message from NPCA Chairman Ron Sparks



The American Jobs Plan, unveiled by the Biden White House earlier this year, includes plans to invest approximately \$2.3 trillion in both traditional infrastructure and other administration priorities over the next eight years.

As many outlets have reported, if passed in its current form, this initiative presents the construction

industry with a huge opportunity – at a minimum – to help rebuild the United States' traditional infrastructure.

According to the White House, approximately 20 percent of the plan is devoted to traditional transportation infrastructure projects, with \$456 billion going to highways, bridges, ports, airports and transit systems, including 20,000 miles of roads.

Precast concrete products are at the heart of all these ventures.

But other measures within the proposal, while typically considered outside the traditional definition of infrastructure, also create opportunities for NPCA member companies, including:

- \$111 billion to replace lead pipes and service lines in water systems that will require manhole products and underground utility vaults.
- \$100 billion to update the U.S. power grid, resulting in the manufacturing of electrical vaults, precast security fences, utility trenches and precast solar panel foundations.
- \$213 billion in new housing development, many of which will require precast basement walls, stairs and foundations.
- \$100 billion to modernize or build new public schools and community colleges, buildings that will require precast products such as stormwater detention systems and shelters.

The proposal also includes billions of dollars for disaster resilience, as well as new childcare facilities, VA hospitals and federal buildings, which provide opportunities to improve and develop underground utility systems.

In all, nearly half of the money proposed within the White House plan is earmarked initially for construction projects that will require the use of precast concrete products.

John Stoltzfus, chief investment strategist at Oppenheimer Asset Management in New York, recently told Forbes that the plan will benefit a multitude of companies across various industries, including concrete. That presents an opportunity for us.

NPCA President Fred Grubbe and dozens of other peer industry group leaders recently participated in the Portland Cement Association's Cement and Concrete Virtual Fly-in, a series of meetings with members of Congress and their staffers to convey the important role that cement and concrete play in building the nation's traditional and expanded infrastructure and to stress the importance of stable, consistent funding for multi-year infrastructure investment. During the course of these meetings with a broad, bipartisan mix of Congressional members or their key staff, a strong consensus emerged on the need for infrastructure legislation to occur sometime this year.

For years, Washington, D.C., has talked about infrastructure but has failed to move forward the necessary legislation. This year, it seems that Congress is ready to act. Reach out to your representative and senators to encourage their commitment to passing legislation this year that supports stable, long-term investment in infrastructure projects in your state and region.

From opportunity comes action. Let's unite our voices and help forge a fully funded plan that invests in our national, state, and local infrastructure while ensuring that precast concrete continues its key role as a leader in the construction industry.

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/technical-services.

Andrew writes:

A large part of my business is painting precast wall panels. Could you provide some guidance on how to measure moisture content prior to painting as well as any best practices to consider?

NPCA Technical Services engineers answered:

Painting concrete requires some preparation to avoid issues with peeling or blistering. Concrete surfaces may have remnants of form release agents on the surfaces, which can cause issues with adhesion when it comes to coatings and paint. Wash and prepare concrete surfaces in accordance with the painting or coating manufacturer's instructions.

Depending on how old the wall is, concrete can contain varying amounts of moisture in the form of liquid and vapor. Go beyond just the concrete surface when assessing the wall's moisture level prior to painting. While the surface may be dry, moisture that may exist within the concrete could eventually make its way to the surface. Paint manufacturer Dunn Edwards recommends that "Moisture content should be under 12% for coatings work to proceed." Various test methods are available to determine concrete humidity. The method outlined in ASTM D4263, "Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method," utilizes an 18-inch-by-18-inch plastic sheet applied to the concrete for 16 hours to indicate capillary moisture. There also are moisture meters.



As for priming, using an acrylic-based sealer or primer on concrete may be helpful. From the PCI Architectural Manual:

"Coatings applied to exterior surfaces should be of the breathing type, permeable to water vapor but impermeable to liquid water. Typically, latex paints are suitable for most exterior applications. Typically, latex paints or epoxy, polyester or polyurethane coatings may be applied to the interior surface of exterior walls if a vapor barrier (paint or other material) is necessary. See Section 3.5.16 for finishing procedures for interior surfaces to be painted. The coating manufacturer's instructions regarding mixing, thinning, tinting, surface preparation, and application should be strictly followed."

Barry writes:

What is the recommended vibrator head size to be used in a 14-inch wall with a double mat of rebar and 4-inch slump concrete?

NPCA Technical Services engineers answered:

There are many things to consider when selecting the appropriate internal vibrator. The first two considerations are the width or thickness of the concrete being consolidated (in your case 14 inches) and the slump of the concrete (4 inches). The radius of action of an internal vibrator, determined by its amplitude setting, should not be greater than the width of the section being consolidated. The stiffest mixes, those with less than a 3-inch slump, likely need the largest vibrator head diameters – greater than 2 to 3 inches. As a general rule, the head diameter should be 25% of the wall thickness – or 3.5 inches in your case. That's among the larger sizes, so we understand why you're reading up on next steps.



Another consideration is the spacing of the rebar mats. The vibrator head should be allowed to lower into the concrete without contacting reinforcing steel. Therefore, the head size should be smaller than the spacing between mats.

If you employ a vibrator that allows for adjustment in amplitude and frequency settings, you can find the right balance between effectively consolidating the concrete and preserving the formwork. But that does take some calculation to determine the settings to start your trial-and-error testing. Your vibrator supplier can assist with testing the efficacy of their equipment in your particular mix.

Charles writes:

Does cube strength accurately represent the strength of in-situ concrete?

NPCA Technical Services engineers answered:

The short answer is: It depends. It sounds like you are talking about

concrete cubes (not mortar cubes) and cast-in-place concrete. If so, concrete cube strength can be similar to the concrete strength in-situ if the concrete in the cubes and the concrete in-situ come from the same batch; the concrete for the cubes is sampled correctly; the cubes are cured in the same conditions as the in-situ concrete; and everything is tested at the same age. Realistically, the consolidation and curing processes for the cubes and the in-situ concrete likely vary. This, in turn, could cause the cubes and the in-situ concrete to have different compressive strength results and could cause significant variations between the cubes and the in-situ concrete in terms of durability, service life and other characteristics.

There are many factors that impact an in-situ concrete product's strength that are likely different for the cubes, because the cubes are cast and cured in controlled, laboratory environments while cast-in-place concrete is cured in a much less carefully controlled environment. Namely, the curing temperature and curing moisture conditions at which the cubes and the in-situ concrete are cured will vary, and this could cause significant differences in the hardened concrete properties of the cubes and cast-in-place material. **PI**

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Best Practices for Preformed Flexible Joint Sealant

Ensure watertight systems are built to last by following these best practices.

By Kayla Hanson, P.E.

Some of precast concrete's greatest attributes in water and wastewater storage, treatment and conveyance infrastructure are its strength, resilience and watertightness. Each precast structure – from tanks and manhole sections to pipes and culverts – is manufactured to exact specifications, ensuring superior performance.

Of equal importance to a precast concrete system's functionality and watertightness is the structure's sealants. Preformed, flexible joint sealants are integral components for creating watertight joints, which not only facilitate the structure's performance but also help protect the surrounding environment.

ASTM C990, "Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants," outlines performance and physical property requirements of both butyl- and bitumen-based preformed flexible joint sealants.

FOLLOW BEST PRACTICES

Follow these best practices for properly selected, sized and installed sealants to help ensure resilient, watertight systems that stand the test of time.

Select the proper sealant type for the job

Certain sealant types and chemical compositions are required for different structures and applications. ASTM C990-compliant sealants are composed of at least 50% hydrocarbons. However, structures that hold, convey or potentially come into contact with fuel or oil shall not be sealed with hydrocarbon-based sealants, because fuel and oil can degrade them. Additionally, structures handling potable water must use sealants that are non-toxic. Local and project specifications will outline requirements, and sealant suppliers can provide advice regarding the best sealant for each situation.

"Butyl' and 'mastic' are terms that get confused in the industry," said Pat Mulhall, vice president of sales with Polylok ZABEL.

Mastic is oil-based and applied with a trowel. It can dry out over time and potentially crack. The term "butyl" is sometimes used as a blanket descriptor for preformed flexible joint sealants. However, preformed flexible joint sealants can be either butyl- or bitumen-based. Butyl- and bitumen-based joint sealants are formed into ropes or strips, are applied from a roll and can maintain their flexible consistency throughout their lifetimes.

Select the proper sealant size and quantity to achieve at least 50% sealant compression

Preformed flexible joint sealants come in a variety of cross-sectional dimensions. The appropriate sealant size and number of sealant ropes required for a particular application depends on the weight of the adjoining precast concrete component and the joint geometry.

The adjoining concrete structure's weight and the size and number of sealant ropes used will determine how much the sealant ropes compress. Supplier guidelines typically state preformed flexible joint sealants must deform by at least 50%, and greater than 50% deformation is ideal. The more the sealant is compressed, the wider the band of sealant will become.

"A wider band of compressed sealant in the joint is always going to be better than a narrow band of equal height," said Sam Lines, engineering manager with Concrete Sealants and 30-year veteran of the precast concrete industry.

The sealant's cross-sectional area will remain the same regardless of its compression. As the sealant band becomes wider, more of the joint will fill with sealant. This, in turn, can provide a better seal.

As far as the possibility of compressing the sealant too much, Lines said it is extremely unlikely.

"I've had the question asked: 'Can you squeeze all the sealant out of the joint?'" Lines said. "The thinnest it usually gets is between 1/16 and 3/16 of an inch. Somewhere in that range, the sealant is going to stop compressing.

"It's like a spring. As you start to compress it, it doesn't take a whole lot of force, but as the spring gets tighter and tighter and the coils get closer and closer, the force required for further compression of the spring gets greater and greater."

Lines also noted that more sealant is not always better.

"Too many pieces next to each other will distribute the load too much and will prevent the proper compression," Lines said. "It's like a snowshoe. Using more sealant distributes the weight over a wider area and reduces the amount of compression."

Sealant sizes, designations and offerings vary by supplier.

"They are available in a wide range of sizes to fit a variety of joint types in treatment tanks, grease interceptors, manholes, box, elliptical or arch pipe foundations, vaults, wet wells and so on," said Dan Brundage, Midwest territory manager with Press-Seal Corporation.

Additionally, sealant size designations may not correspond to the actual sealant dimensions. Like dimensional lumber, the actual sealant dimensions generally are smaller than the nominal sealant size.

When in doubt, reach out to a sealant supplier for guidance, specifications and recommendations.

Assess the joint's integrity and make any necessary repairs

Inspect the joint and surrounding areas for defects. A hairline crack or

spall near or in the joint must be repaired properly before proceeding.

Simply replacing spalled concrete in its original location without repairing it can severely compromise the joint and the structure's watertightness.

Ensure the joint surface is clean, dry and free of debris

Preformed joint sealants exhibit the strongest adhesion when applied to clean, dry surfaces. The presence of moisture, dust or debris can reduce a sealant's ability to bond with the concrete, similar to how dust or dirt on steel reinforcement hinders the reinforcement's bond with the concrete cast around it.

Joints should be prepared with a stiff-bristled brush to remove any concrete high points, flashing or debris. Joint surfaces also should be clean to the touch without leaving excessive lime or dust residue.

Assess the need for additional joint surface preparation

Preformed joint sealants provide the most effective seal when applied to smooth, level surfaces. Even minor high or low points on the joint surface could cause small gaps between the concrete and the sealant, providing miniscule yet viable points of ingress or egress in what is intended to be a perfectly sealed joint.

"The condition of the joint is one of the most important things," Brundage said.

Additionally, ASTM C1227, "Standard Specification for Precast Concrete Septic Tanks," and ASTM C1613, "Standard Specification for Precast Concrete Grease Interceptor Tanks," state the maximum gap between the two mating joint surfaces shall not exceed 3/8 inch before the joint sealant is applied. Sealant manufacturers use this maximum allowable gap measurement to properly size sealants and ensure the selected sealant dimensions provide a proper seal.

Depending on the type of precast structure and its casting orientation, the joint surface may be formed or finished. Formed joints, while generally smooth and precise, could contain small, exposed bug



Properly selected, sized and installed sealants help ensure resilient, watertight systems that stand the test of time.

holes. Finished joints could have slightly uneven textures compared to formed surfaces. In either case, consider applying a primer, adhesive or coating to the joint surface to fill in slightly lower points and create a smoother application surface for the sealant. Ensure the primer, adhesive or coating is appropriate for the application and that they dry completely before applying the sealant.

Store the sealant at an appropriate temperature and away from dirt and debris

Butyl-based joint sealants generally are intended to remain around 40 degrees F or warmer to ensure compressibility. Some suppliers offer butyl-based joint sealants that can be applied as cold as 0 degrees. Ensure you are using the right sealant type for the temperatures at which you plan to store it. In cold climates, consider specifying ASTM C765, “Standard Test Method for Low-Temperature Flexibility of Preformed Tape Sealants” to provide some indication of the sealant’s flexibility and adhesion at low temperatures.

Bitumen-based joint sealants become firm and incompressible at colder temperatures and significantly softer and stickier at warmer temperatures.

Be careful to keep the sealant in its packaging and with the protective waxed

paper or plastic film intact as long as possible to preserve its adhesive properties. Dust, dirt, debris and other contaminants that come in contact with sealant can compromise its ability to bond to concrete surfaces.

Select the sealant location within the joint

The sealant rope should be positioned as close to the joint’s centerline as possible, regardless of the type of joint. This helps ensure the entire sealant rope remains within the joint after the sealant is compressed by the adjoining concrete component.

“Keeping the sealant within the joint is imperative,” Lines said.

Any sealant that is expelled from the joint and bulges out of the side of the structure reduces the cross-sectional sealant area contained within the joint and reduces the robustness of the seal.

Many joints are interlocking – including tongue-and-groove or shiplap – as opposed to slab-style joints, which consist of two flat surfaces bearing against one another. For tongue-and-groove joints, apply sealant to the depression in the center of the groove, as shown in Figure 1 below. For shiplap joints, the sealant may be applied to either the upper joint surface, lower joint surface or both, as shown in Figure 2 below. If one sealant rope is used, the sealant is typically applied to whichever

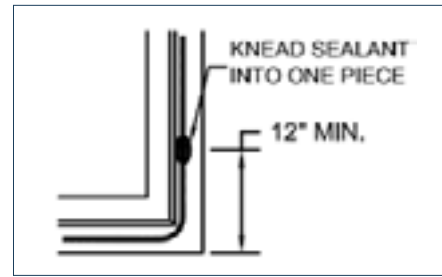


Figure 3: Proper sealant placement around corners is critical to creating a reliable and consistent seal around the structure. Start applying the sealant at least 12 inches away from any corner and knead the adjoining sealant ends together into a continuous rope. Avoid starting the sealant in corners and avoid overlapping sealant ropes, which can cause gaps in the sealant and uneven sealant compression.

joint surface (upper or lower) is adjacent to a greater hydrostatic load or is deemed more susceptible to water infiltration or exfiltration.

Determine where to begin the sealant rope application and avoid starting at a corner

A sealant rope’s starting location around the structure’s perimeter is critical. For non-circular structures, begin applying the sealant rope to a joint surface on any side of the structure. Never begin applying the sealant in a corner. Starting the sealant rope in a corner could cause the structure’s adjoining component to bear slightly unevenly on the sealant, which could compromise the seal. Begin applying sealant at least 12 inches away from any corner to help prevent uneven bearing.

Apply the sealant as a continuous rope without stretching the material

Apply preformed flexible joint sealant with the exposed sealant surface facing down, pressing it directly against the prepared joint. Avoid piecing together multiple pieces of sealant. Instead, apply the sealant as a continuous rope around the perimeter of the joint. Piecing together multiple sealant segments is a more labor-intensive process and introduces opportunities for improper seals and sealant discontinuities.

Ensuring the sealant’s entire cross-section remains intact and contained within the joint is crucial to creating a watertight seal.

“Never stretch the sealant,” Mulhall said.

Stretching sealant reduces the rope’s cross-sectional area, which can compromise a seal and create inconsistencies in how an adjoining concrete component bears on the seal.

Also, work to keep the protective waxed paper or plastic film intact while applying sealant to prevent sealant contamination and

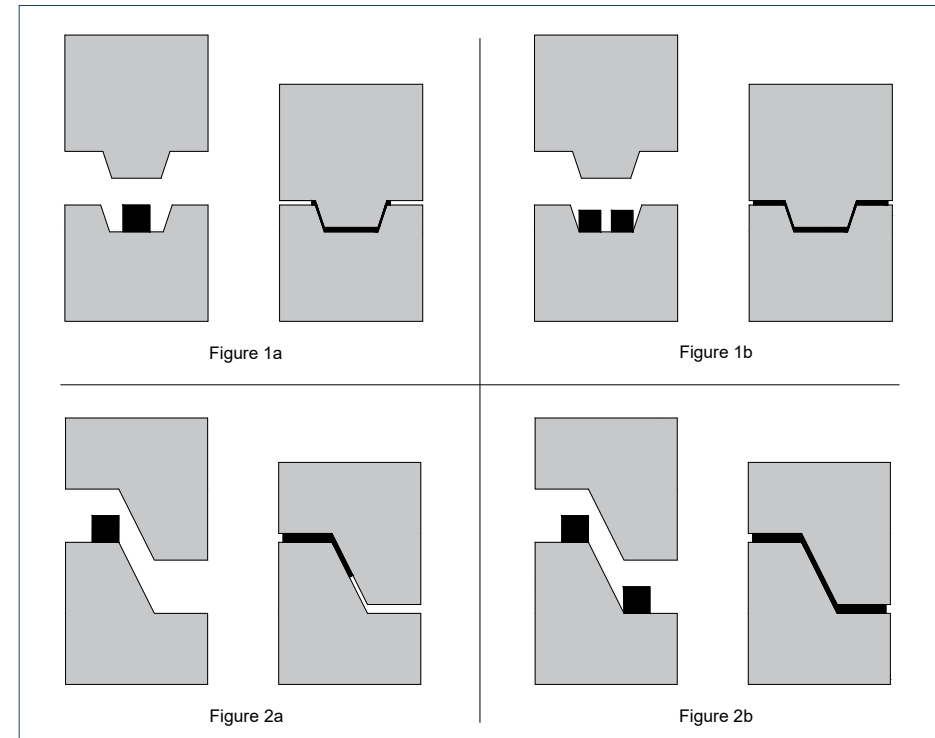


Figure 1: Proper sealant placement in a tongue-and-groove joint using (a) one sealant rope and (b) two sealant ropes. **Figure 2:** Proper sealant placement in a shiplap joint using (a) one sealant rope and (b) two sealant ropes.



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reduced adhesion to the adjoining concrete surface. The protective paper should be removed just prior to joining the precast sections.

Cut the sealant rope to create a butt joint

Upon completing the sealant perimeter around the structure's joint, terminate the sealant rope with a clean cut to create a butt joint or a 45-degree mitered joint. This helps ensure a reliable seal and allows the adjoining concrete surface to bear evenly across the entire perimeter of sealant.

The terminating sealant end also can be laid directly adjacent to – and in contact with – the beginning of the sealant rope, along the tail end to extend a few inches past the sealant starting point.

Avoid overlapping the sealant ends, and never leave gaps in the sealant perimeter

Avoid overlapping the sealant ends when completing the sealant perimeter around the structure's joint. Even if the sealant is properly applied, a tiny – even microscopic – gap likely will remain under the overlapping sealant segment.

Overlapping the sealant also can create high points in the sealant, which could lead to inconsistent sealant compression around the structure.

Never leave a gap in the sealant rope's perimeter around the structure. It may be possible for the adjoining precast component to compress the two sealant pieces such that they touch, however, that approach is unreliable. It also is unlikely that joining sealant segments will contain a sufficient sealant surface area or that the two sealant ends thoroughly combine into a continuous, homogeneous sealant rope.

Knead the sealant ends together

Whether a butt joint, mitered joint or aligned side by side, the adjoining sealant ends must be carefully kneaded together to create a continuous sealant rope around the structure's perimeter.

Working the two sealant ends together so there are no gaps and the sealant's cross-sectional area is consistent helps ensure a reliable seal and consistent sealant compression around the structure's perimeter.

If the adjoining concrete structure is removed after the structure was sealed, discard the sealant

"Removing the previously sealed adjoining concrete component will cause the sealant to stretch and tear," Lines said. "It'll tear itself apart."

Compromised sealant should be removed and discarded. Do not attempt to piece the sealant rope back together. After removing the original sealant, the joint surface should be reinspected, and new sealant should be applied.

SMALL BUT MIGHTY

Though it may appear to be a seemingly simple material and its placement a straightforward task, properly applying preformed flexible joint sealant requires careful attention to detail. Appropriate sealant selection, proper joint preparation and mindful sealant placement are imperative to many precast concrete systems' functionality and watertightness.

Follow preformed flexible joint sealant best practices to provide reliable, resilient seals that create dependable, watertight joints and enable a variety of precast products to work seamlessly together as continuous and efficient systems. **PI**

Kayla Hanson, P.E., is NPCA's director of technical services.

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DOUBLE POURING:

What You Need to Know to Make It Work

By Claude Goguen, P.E., LEED AP

What is double pouring?

Double pouring is the process of casting in the same form two times in the same day.

It is not uncommon for precast concrete manufacturers to face situations where production needs exceed capacity. Double pouring can be a viable solution to the problem.

Double pouring is the process of casting in the same form two times in the same day, effectively multiplying the output of the form.

The key to success when double pouring is planning. It is important to recognize production capacity issues long before they occur. Strategies and processes can be set in advance to be better prepared when the need arises. To effectively execute double pouring, consider the following:

- MIX DESIGN
- PRODUCTION PROCESSES
- QUALITY CONTROL
- SAFETY

MIX DESIGN

Embarking on a double-pouring schedule does not always involve a change in mix design. However, precasters should nevertheless examine the mix design to ensure it is adequate for a significant production modification. When double pouring, precasters usually need to strip products sooner than normal and, therefore, need to accelerate concrete's strength gain. This may require modifying the concrete mix.

► Water-to-cementitious-materials ratio (w/c_m)

Strength gain occurs when the water and cementitious materials chemically react and create a paste. That paste hardens at a certain rate due to many factors. One main factor is the amount of water used in the mix.

When a cement grain reacts with water, the hydration products build up on the outside of the grain and progress inward. The volume of the hydrated product is larger than the original cement grains, so as multiple grains hydrate, the space between them shrinks. Soon, adjacent hydrating grains of



Examining your mix design is the first step in modifying production schedules.

cement connect and start forming a network of hydration products. This starts the setting process (Figure 1). When there is more water in the fresh concrete mix, the cement grains are farther apart, and it takes longer for connections to occur and the network of hydration products to form because of the added space. More water means slower strength gain and, ultimately, lower strength.

Strategies to lower water content include monitoring aggregate moisture content and using set-accelerating and water-reducing admixtures.

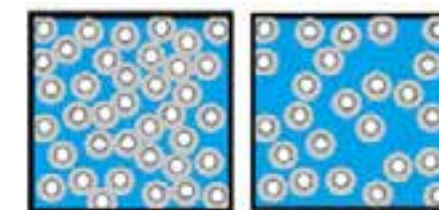


Figure 1. At left, cement grains surrounded by less water, more readily developing a tighter network. At right, cement grains surrounded by more water, spaced further apart.

► Cementitious materials

The type of cementitious materials used in precast concrete production affects set time and strength gain. Portland cements come in many different types and blends to address specific demands. Type III cement, also called high early strength cement, provides expedited early-age strength because of its fineness. This can be helpful in double pouring but is not a necessity. Many

producers double pour successfully with Type I or Type I/II cement.

Supplementary cementitious materials (SCMs) such as fly ash and slag generally retard concrete set. The degree of set retardation depends on numerous factors, including fineness, composition and amount used. Other SCMs, such as silica fume and metakaolin, can cause faster set. Assessing SCMs ahead of time is recommended when considering double pouring.

► Admixtures

There are a few options to consider when looking at admixtures as a strategy for facilitating double pouring. The first involves water content. Water reducers work well when looking not only at accelerating concrete strength gain but also enhancing concrete quality.

Set-accelerating admixtures are effective at increasing strength gain at early ages. Consider non-chloride-containing accelerators when working with reinforced concrete.

Other options are available to precast manufacturers, including hardening or strength-enhancing admixtures. Those focus more on strength development while preserving workability at early ages and are well suited for a double-pouring scenario.¹

► Mix design modification through testing

The key to mix design modification is testing. To accurately assess the impact of incorporating one change or addition to the

mix, samples or cylinders should be made and tested. Strength tests and temperature gain can be measured with each modification and lead to better-informed decisions.

“We will test different cylinders ahead of time to see how they perform,” said Mark Sinicrope, director of technology at Master Builders Solutions. “For example, we will test cylinders with no accelerator, with just an accelerator and then with a mix of accelerator and strength enhancer. The producer can see the results and analyze what option works best for them.”

PRODUCTION PROCESSES

Time, moisture and temperature play a crucial role in the strength gain of precast products. When double pouring, the goal is to not only reach sufficient strengths earlier but also maintain optimal curing conditions for the structure to continue gaining strength even after it is stripped from the forms.

When looking to strip a product within a few hours rather than the next morning, there are a few approaches to consider.

► Raising the temperature

Hydration reactions, like most chemical reactions, are temperature dependent. Higher temperatures lead to faster reactions. That is why an effective double-pouring strategy can include maintaining higher temperatures during placement and curing of precast structures. Most of these temperature-control methods come both prior to and after stripping the product.

The temperature of concrete constituents can have a significant impact on concrete temperature. Consider using warm water and heating aggregates during colder weather. Any surfaces that come in contact with concrete also can affect temperature, so heating formwork and reinforcement is also helpful.

A simple option to preserve or achieve optimal concrete temperatures includes adding insulating blankets over the structures once they are cast, consolidated and finished. This encloses the heat released by the hydration process – raising the concrete temperature – and helps prevent moisture loss. Using insulating blankets enclosed by moisture-proof coverings is optimal. If this is not sufficient, you can direct heat into an enclosure to help accelerate the curing process. Some producers use an enclosure made of canvas or reinforced polyethylene film to confine the formwork and source of heat.



An outdoor curing enclosure can help create an optimal curing environment for precast products by maintaining appropriate temperatures and humidity levels.

Avoid pointing heaters directly at the formwork or exposed concrete, as this can create a hotspot and cause subsequent quality issues because of extreme differences in concrete temperature. With gasoline-powered heaters, be wary of carbon monoxide accumulation, not just for a dangerous buildup in the air but also for carbonation of exposed concrete surfaces. Make sure to provide adequate ventilation.

The most efficient means of accelerating strength gain of precast concrete through temperature and moisture control is steam curing. Live steam curing requires enclosures where steam is circulated throughout. Avoid raising concrete temperatures too high.

“You don’t want to exceed an internal temperature of 155 F to 160 F,” GCP Applied Technologies Technical Services Manager Brett Harris said. “You can monitor the temperatures with sensors or wires.”

There are several options in the marketplace for temperature sensors, including thermocouples, wired sensors and fully embedded wireless sensors.

Do not expose a structure to rapid temperature rise when curing or an extreme temperature decline when yarding. Applying heat and then exposing a structure to cold temperatures could lead to thermal cracking. Consider using curing enclosures outside in colder conditions.

“In South Carolina, we ran into a situation where an 8-inch base was poured outside in the sun and cooled at night,” Harris said. “This resulted in cracking due to thermal stresses. Adding Styrofoam to the top of

the base solved this issue.” In this case, the Styrofoam served as an insulator.

► Stripping and moving the structure

The minimum required stripping strength of a precast structure depends on the structure’s weight, dimensions, how it is stripped, and how it will be lifted and handled. In trying to accelerate the production process, allowing a lower stripping so the product can be stripped sooner could be acceptable if the structure can still be stripped and handled safely at a lower strength. That requires lowering the stresses on the freshly hardened product. There are a few ways to achieve this.

The optimal situation is leaving the product in place and removing all formwork. Dislodging formwork from a stationary structure still applies stress to the product but far less than having to pick up the structure from the formwork. This may require a look at other types of formwork that open, swing and/or collapse, thus enabling the poured structure to stay in place on the production floor or pallet.

Plant conditions may require moving a structure a short distance, even if formwork is stripped away. Casting the product off the floor on dunnage or a pallet system can permit easy movement without exposing the structure to high stresses. Some producers move structures over from their formwork onto dunnage that includes foam or other types of soft supports for added protection. If the product can be left adjacent to the open, soon-to-be-used-again form, that helps maintain a controlled environment for further strength gain.

If the structure must be moved outside and the concrete’s strength development is slower than during normal operations, additional measures may be needed to reduce dynamic loads during transport, such as storing the structures near the plant.

QUALITY CONTROL

During double-pour periods, the quality control team still has the same function of making sure all products meet or exceed applicable standards. However, they will be harder at work conducting twice the number of pre- and post-pour inspections as well as fresh- and hardened-concrete tests.

Double pouring may require additional qualified QC personnel, which in turn may require additional training and ACI certification.

SAFETY

Modifying the manufacturing landscape and adding more hours to the production day to accommodate a double-pouring schedule comes with added safety considerations. Safety personnel should be included in planning and implementation so they can identify added risks earlier to remove them or properly train employees.

Additional trained safety personnel may be necessary to monitor longer and busier production days.

DOUBLE POUR EXAMPLES

To meet one project’s demands, Andy Hayward of Panhandle Concrete Products in Scottsbluff, Neb., had to pour multiple median barriers each day to meet the project timeline.

“We used both Type III cement and

accelerators in our mix,” Hayward said. “We created an assembly line production layout and were able to avoid picking up the median barrier by its lifters. We had two 8-hour shifts, and each form was poured twice per shift, meaning we would pour four times in 16 hours.”

“This forced us to look at ways to be more efficient and implement some lean production practices.”

Drew Wieser of Wieser Concrete Products double poured box culverts at their Roxana, Ill., plant.

“We poured two box culverts in the same mold over 12 hours,” Wieser said. “We used SCC with Type I/II cement, a water reducer and accelerator. We would reduce our spread a bit.

“We aimed to reach 2,000 psi in four to five hours. We would strip the culvert without

having to lift it so we can just leave it on the pallet.”

PLAN AHEAD

Going from a conventional, single-pour-per-day operation to a double-pour operation requires plenty of careful analysis and planning. Waiting until the need for double pouring arrives can make it difficult to plan effectively and push the producer into a learn-as-you-go scenario. This can be costly – even counterproductive.

Take the time now to start planning for this potential manufacturing shift. Even those who have double poured before can re-examine their processes and improve efficiency, discover useful strategies and increase the chances of success when that next big job arrives. **PI**

Claude Goguen, P.E., LEED AP, is NPCA’s director of technical education and outreach.

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“We had two 8-hour shifts, and each form was poured twice per shift, meaning we would pour four times in 16 hours.”

– Andy Hayward, Panhandle Concrete Products

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HOW TO TALK TO END USERS ABOUT REPAIRS AND SURFACE IMPERFECTIONS

By Eric Carleton, P.E.

Detailed plans, pertinent data and industry knowledge are all crucial in speaking with end users about concrete repair.

How comfortable are you having difficult conversations? If you are like most people, these are conversations you try to avoid. Sometimes, though, hard discussions are necessary. And being prepared is the first step toward providing a good solution.

As precast concrete producers, a primary goal of every job is to fabricate finished products that comply with project and material standards. It also is important to meet or even exceed each customer's expectations in order to retain a market segment.

For precasters, that customer – or “end user” – may be a contractor buying the product. It also could be a project owner who approves the final installation and pays for completed work. Both parties are equally important to satisfy in order to ensure a successful project.

Even when product manufacturing follows regimented quality

assurance and quality control programs, imperfections still may occur. It is a precast producer's responsibility, whenever necessary, to clearly and respectfully educate customers on possible imperfections and viable remedies based on product standards and accepted industry practice.

UNDERSTAND THE ISSUE TO QUANTIFY AND CLASSIFY THE DEFECT

When someone is trying to sway your opinion, who are you more likely to trust – a person who backs up statements with knowledge, data and a viable plan or someone who appears to argue their points as they think of them? Most people, especially in business decisions, prefer the former.

When discussing a precast product and a potentially unacceptable defect or a viable repair remedy, it is imperative for a precast

representative to be ready with all facts at hand and a complete plan detailing the repair procedure, products, past successes and previous acceptance.

To reach this end, a precaster must develop, implement and continually improve upon a written product defect analysis that includes defect descriptions, classifications and the decision process concerning whether something can or should be repaired. This document should describe any anomaly that falls outside of the plant's normal acceptance criteria established by plant management. The criteria may exceed the minimum prescribed product standards (such as those published by ASTM International) or be specific to job-related criteria detailed within project plans and specifications.

These product quality expectations should be communicated clearly to the entire production team. If an issue is identified as exceeding the established limits, then the product defect analysis and elimination plan is implemented. This analysis determines the root cause of the defect and whether it was a one-time production error (e.g., a form latch not closed properly or poor handling of an individual piece in the yard) or a larger production process that may affect a day's or a week's production, such as continuous honeycombing or constant tolerance problems.

Regardless of the determined cause – which needs to be immediately addressed and corrected – a product cast with an identified defect must not be shipped. At this point, a decision must be made whether the identified flaw is repairable to meet the project's requirements or should be scrapped and replaced.

LEARN WHAT THE PRODUCT STANDARDS SAY

The question of reparability begins with the applicable product standards and project specifications. Many precast products manufactured by NPCA members require adherence to the respective ASTM standards. Most ASTM standards for these products include provisions to allow for some repair.

For example, ASTM C478, “Standard Specification for Circular Precast Reinforced Concrete Manhole Sections,”¹ reads:

- 9.1. Repair of manhole products shall not be prohibited, if necessary, because of imperfections in manufacture or damage during handling, and will be acceptable if, in the opinion of the owner, the repaired products conform to the requirements of this specification.

ASTM C858, “Standard Specification for Underground Precast Concrete Utility Structures,”² reads:

- 9.1. Precast concrete structures may be repaired. Repairs shall be performed at the direction of the manufacturer in a manner to ensure that the repaired structure conforms to the requirements of this specification.

Similar language in both standards permits a repair if the final repaired product still complies with all specifications. However, notice the difference regarding the “owner” or customer involvement.

Other important concrete standards and codes require owner approval of precast product repairs, such as American Concrete Institute's ACI 301-20, “Specifications for Concrete Construction.”³ Section 13, “Precast Structural Concrete,” reads:

- 13.2.15. Defective Work—If specified, repair chipped, spalled, or cracked members. Obtain acceptance from Architect/Engineer before making structural repairs. Replace unacceptable members with precast concrete members that comply with requirements.
- 13.3.5(a). Submit request and procedures to repair members. Repairs will be acceptable provided structural adequacy, serviceability,

durability, and appearance are not impaired.

The important fact with these provisions is that national standards recognize concrete products do occasionally require repairs that need to be performed properly.

It is important for precast producers to understand expectations prior to bidding. Are repair options available if needed? What is the field inspection acceptance criteria?

Precast products visible after installation often have a higher level of acceptance benchmarks. ACI 301-20, Section 13, “Precast Structural Concrete,” states that patching material and curing methods are not distinguishable from the original concrete at a distance of 20 feet.

For architectural concrete, ensuring that repair processes maintain the visual aesthetic quality of unblemished precast components is an integral part of the preproduction process. ACI 301-20, Section 14, “Precast Architectural Concrete,” reads:

- 14.1.4.2. Sample panels—Unless otherwise specified, before fabricating CA members or architectural precast concrete units, produce and submit at least two sample panels each with an area of at least 16 ft². Incorporate full-scale details of architectural features, finishes, textures, and transitions.
- 14.1.4.2(a). Locate sample panels where indicated in Contract Documents.
- 14.1.4.2(b). Damage part of an exposed-face surface on two sample panels for each finish, color, and texture, and demonstrate sufficiency of repair techniques proposed for repair of surface damage.



For buried concrete products structural and durability aspects of repair methods are the primary focus and not typically aesthetic concerns.



Successful businesses talk up-front with their clients about solutions to issues a project may face. Waiting until trouble happens only compounds the difficulty of the situation.

- 14.1.4.2(c). After acceptance of repair technique, maintain one sample panel at manufacturer's plant and submit one for project site in an undisturbed condition as a standard for visual evaluation of completed Work.

Though this may seem extreme for many buried precast infrastructure products, it may be beneficial to have an example of a standard cementitious material repair or a finished example of an epoxy or a polymer concrete repair product on-hand at the plant. This mock-up could be an important part of a plant tour or even an effective hands-on means to show the expertise, workmanship and quality repair that your plant performs.

However, while most customers will permit repairs as an exception or outlier to the norm, a continuous string of products showing or needing repair without a quick resolution to the root problem will raise questions about production practices and product fitness, often leading to product rejection and future job losses.

REPAIRABLE OR NOT?

As mentioned earlier, when a defect is detected and the cause corrected, a decision remains to be made regarding whether the product should be repaired or replaced. Factors to consider include:

- **Restriction by project requirements.** Some project specifications flatly deny any repair to a precast item despite considerations of the product application or material standards permitting it. Be aware of these restrictive provisions and account for them accordingly.
- **Finances.** This is a straightforward comparison between the expense to repair – time, labor and material – versus replacing, including lost opportunity and lost profit.

- **Time.** Will casting a new product cause problematic project delay to the contractor?
- **Risk.** Is the precast product application so sensitive or severe that the potential exists for the repair to not meet the service requirements?
- **Reputation.** Job conditions may allow furnishing a repaired product, but will this hurt your company's brand in the long run?

In some cases, the project owner will provide clear guidance on what is or is not repairable. Such guidance is provided to department of transportation inspectors with the development of the American Association of State Highway Transportation Officials' R73-16, "Standard Practice for Evaluation of Precast Concrete Drainage Products."⁴ This document was developed by DOTs, consulting engineers and precast industry representatives to provide guidance on acceptance criteria for surface defects such as honeycombing, bug holes and joint distress. The document scope provides insight:

- This standard practice describes the evaluation of precast concrete pipe, box culverts, manholes, and drainage inlets. This standard also describes criteria for acceptable products, repairable products, and the rejection of defective products. All repairs shall conform to the criteria found in this document or to contract documents as applicable.
- This standard practice is applicable to storm water management precast concrete products, manufactured by both the wet cast and dry cast production methods, after curing and prior to installation.
- This standard practice covers the inspection of finished products manufactured per M 86, M 170, M 199, M 206, M 207, M 242, M 259, and M 273; and ASTM C 443, C 858, C 913, C 985, C 1417, C 1433, C 1504, and C 1577.

Evaluation guidelines are included for the following conditions: cracks, manufacturing defects and damaged ends.

WHEN AND HOW TO HAVE THE DISCUSSION

Ideally, the best time to discuss repair with a customer, inspector or other end user is before you absolutely must talk to them. Early assurance tends to lead toward a more positive outcome. Additionally, developing a strong rapport early on in the project often lends itself to a discussion with less stress later.

Start by requesting to attend the contractor's preconstruction meeting. This provides an opportunity to meet the entire project construction team.

Offering a plant tour is also an excellent way to bring critical personnel from both sides together. And if your staff has produced written repair protocols or even a helpful mock-up during a repair training session, this is an opportune time to discuss quality repair options should they be needed.

To paraphrase Louis Pasteur, "Luck favors the prepared mind." With respect to acceptance of precast product repairs, "Success favors the prepared precaster."

More information on precast concrete repairs can be found at precast.org. **PI**

Eric Carleton, P.E., is NPCA's director of codes and standards.

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Dialogue Education:

A Concrete Method of Adult Training

By Alex Morales, M. Ed.

NPCA has a robust slate of continuing education programming available to industry employees, precast business owners, members of the world of academia, specifiers, regulators and others. We evaluate every course, and over the last two decades, we have gathered significant information about how to both improve our educational offering quality and target new content.

That feedback, reviewed by and combined with feedback from the NPCA Education Committee, has proven invaluable.

While needs assessments before a course and evaluations after a course are foundational principles to follow when managing industry-leading education programs, how these sessions occur is an even more important aspect of adult continuing education programming. It is important to understand that adult education (andragogy) is managed

ANDRAGOGY: the method and practice of teaching adult learners; adult education

PEDAGOGY: the method and practice of teaching, especially as an academic subject or theoretical concept

very differently than education targeting children (pedagogy). This difference must underpin any adult education programming to provide meaningful experiences that improve your brand, disseminate information accurately and ensure the development of long-lasting relationships.

ANDRAGOGY

Andragogy describes the method and practice of teaching adult learners. Notice that the definition identifies “learners,” not “students.” If you have a group of working adults in a classroom and see them as students, you may not be optimizing your relationship with your audience.

When you see your attendees as “students,” you tend to see yourself as the “teacher.” This viewpoint creates hierarchy. We are conditioned to respect teachers as authority figures. We raise our hands before we speak so as not to interrupt them and generally do not challenge them, even if it means walking away without fully understanding a concept. This is not a great environment for marketing products and services or establishing enduring professional relationships, which are key secondary goals of industry-sponsored training.

The student-teacher hierarchy is a pedagogical relationship meant for students who have yet to enter the workforce. Once an individual enters the workforce and gains real-world working experience, different approaches are required to reach them with new knowledge.

DIALOGUE EDUCATION

In 1997, Clifford Baden wrote “Adult Learning in Associations,” published by the American Society of Association Executives.¹ The text explores the differences between adult learners and those learning in traditional university classrooms at a time when associations nationwide were looking to create training programs for the industries they represent. In the years that followed, NPCA began creating and refining robust educational opportunities for the precast concrete industry as a part of the Manufactured Concrete Exposition (MCX), the predecessor to The Precast Show. That evolved into the Precast University curriculum NPCA offers today.

One of the contributions to our industry’s success in the continuing education space was incorporating the concept of dialogue education, a learner-centered system of teaching that is

purposeful, engaging and collaborative.

In her groundbreaking text, “Learning to Listen, Learning to Teach,” Jane Vella lists myriad principles of dialogue education.² If you have participated in any NPCA-sponsored course during the last two decades, you may remember seeing some of them in your speaker confirmation letters.

- ▶ **Respect for learners as decision-makers**
- ▶ **Immediacy of the learning**
- ▶ **Safety**

These three of the tenets of dialogue education are important to keep in mind when your business conducts continuing education programs locally.

RESPECT FOR LEARNERS AS DECISION-MAKERS

You might suspect that this tenet points to the level of employee we train – that they are managers, directors and otherwise top-level decision-makers in their own roles. But this refers to the fact that adults are decision-makers across all aspects of their lives. This differentiates their learning from that of grade schoolers.

Precast concepts have not traditionally been taught at the university level, even in engineering programs that focus on reinforced concrete design. It can be tempting to decide what information you want to relay based on the outcome you desire from the attendee. For instance, if you are in sales, you might deliver information that you hope will get you to a close. If you are in finance, you might provide information that you hope will get your invoices paid faster. Those aren’t necessarily bad end goals. However, as Vella writes, “Adults desire to be respected as subjects and resist being treated as objects.”

In everyday language, that means we need to involve attendees as much as possible in deciding what content we present. We need to speak with them – not to them or at them. This is true whether a national association is conducting the training or a company hosts its own lunch-and-learn program.

There’s a time and place for sales pitches. Consider how your family physician’s office likely has signs posted that state meetings with pharmaceutical representatives are scheduled or reserved for a particular day. We need to be careful to keep sales tactics and training initiatives separate, lest both be ineffective for not respecting the learner and the role they intend to play prior to entering a session.

IMMEDIACY OF THE LEARNING

Your physician’s office certainly needs to meet with pharmaceutical representatives to obtain prescribing information and remain current on the efficacy of medications. However, no one wants their pediatrician walking out of an appointment because a sales representative dropped in unannounced. You reserved time with your doctor, and it is important for physicians to prepare for meetings with pharmaceutical representatives outside of appointment hours so they can apply what they’ve learned.

Immediacy in dialogue education is not about the timing of the meeting, although it is important to ensure everyone is in a training frame of mind. It’s about being able to use the content soon after the training is done.

And, as Vella writes, “Adult learners need to see immediate usefulness of new learning.”

SAFETY

If an employee obtains a crane operator certification, doing it right is a health and safety issue. The content of the associated training should not be about how the steel is made, how the crane is built or where the hooks come from. While that information is interesting, it is not content that the learner can immediately put to use on their operator certification exam or out in the plant to demonstrate their ability to operate a crane safely.

In dialogue education, however, safety refers to ensuring participants feel safe speaking up and contributing. Dialogue education seeks to be collaborative with adult learners. And remember, we define adults as those who have entered the workforce and have real-world work experience. It’s tapping into that experience that enriches each training experience.

“The principle of safety enables the teacher to create an inviting setting for adult learners,” Vella writes.

Attendees should feel comfortable speaking and sharing during training, which means facilitators should remain mindful not to label any idea as a bad idea, call any comment silly or tell someone that they’re wrong. This inevitably halts adult participation.

The power of dialogue education in teaching adults is evident throughout research, but you do not have to comb the halls of academia, obtain an adult education degree or publish research data in academic journals to prove it. The principles of dialogue education serve as the foundation of NPCA’s education



NPCA/Allen

programming and have done so for the past two decades, informing decisions on how to improve curricula, create new classes and brand an entire Precast University concept.

These three tenets of dialogue education are paramount for running successful adult education courses. Show respect for learners as decision-makers by conducting thorough needs assessments, ensure content is geared to what learners say they need and immediately address any issues. Your presentation should also allow for constant feedback loops throughout training so learners can express themselves and bring their life experiences to your classroom.

Many times, when in dialogue with other students, you will find you have created a training environment where you are actually learning from your attendees – that is when you know you're fully engaged in dialogue education. **PI**

Alex Morales, M.Ed., is NPCA's director of workforce development.

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Setting Up **New Employees** for **SUCCESS**

The ‘set-it-and-forget-it’ approach to hiring doesn’t work anymore. Here’s how to break that trend and start setting up new hires for long-term success.

By Bridget McCrea

Employee onboarding can get lost in the weeds, especially when business is brisk. Vacant seats need to be filled quickly, and hiring managers are busy putting out their own daily fires.

In hopes that recently hired employees will step into their new roles quickly and effectively, employers may be tempted to skip over some steps or details during the onboarding process without realizing their importance.

Put simply: Don’t.

Critical factors to a new employee’s short-term success and a company’s long-term viability include:

- ▶ **Developing accurate job descriptions for every position.**
- ▶ **Setting realistic job expectations.**
- ▶ **Communicating expectations clearly and consistently.**
- ▶ **Providing continuous, usable feedback.**

Add training, mentoring and coaching to strengthen any onboarding process. This not only sets the tone for a positive company culture, but it also helps set individuals up for success in a tight labor market where skilled workers have become increasingly difficult to find, recruit and retain.

High employee turnover significantly impacts a company’s bottom line. Employee Benefits News reported that the average cost of losing an employee is 33% of that person’s annual salary. With 76% of companies admitting that their new employee onboarding processes are “underutilized” and about 22% of employees interviewing for new jobs because they don’t feel that their



work is being recognized,¹ it has never been a better time to bolster onboarding and training processes.

“With work staying pretty consistent regardless of the COVID-19 pandemic, the need for talent hasn’t changed,” said Bob Verchota, owner and senior consultant at RPVerchota & Associates.

“Depending on their specific industry and geography, getting and keeping good people is a continuous challenge for most companies, including precasters.”

IT STARTS WITH AN ACCURATE JOB DESCRIPTION

Jotting down a few notes in hopes that prospects understand what they’re getting themselves into when they apply for a job is insufficient.

Recruiting and training the right employees starts with ensuring the job description accurately outlines what you expect that worker to do. Human resources personnel benefit by talking to the men and women on the plant floor in order to understand exactly what goes into a day’s work.

“Finding the best candidates starts with an accurate, detailed job description,” Verchota said. Every description should include the responsibilities, competencies, skills, experience and education required for each specific position.

“Make this the first thing you do when you’re looking to fill a position, particularly if you’re looking to onboard candidates, bring them up to a high-performance level as quickly as possible and retain them.”

When potential employees understand the work and responsibilities, they can self-select whether it’s a good fit for them.

Megan Kitchner, owner and general manager of Atlantic TNG, said

nauling down specific job descriptions can be challenging for precasters who have a variety of positions to fill.

Verchota said the first step is to speak the language of the position, which means getting out onto the shop floor and documenting firsthand exactly what staff members are doing on a daily basis, then incorporating it into the job description. In other words, don’t leave this responsibility solely to a human resources representative to handle.

“Have someone who is working out on the floor draft or even dictate his or her own version of a job description and performance expectations,” Verchota said. “You can do the same thing with your

engineers and sales teams, both of which can help to fill in some of the verbiage that's being used to describe the positions the company is looking to fill."

POLISH YOUR INTERVIEW PROCESS

Interviews help companies sort through top candidates and select people who are a good match. At StructureCast, owner and president Brent Dezember said the company does at least six sets of interviews during a six-week period when narrowing down manager candidates.

Prospects interview with their supervisors three times and then repeat the process with three different company managers using a predetermined list of questions and procedures focused on getting a feel for the candidate's personality, skills and objectives.

"After each interview, the hiring committee gets together and

compares notes," Dezember said. "If they're willing to go through a six-week interview process, great. If they're not, we're okay with that."

After the third interview, StructureCast asks each candidate for the cell phone numbers of six personal and six business references.

"We call them after hours and ask them to give us a great reason why we should hire the potential candidate," Dezember said. "If we get a call back is basically our answer to whether they can refer the person or not."

For administrative positions, StructureCast reduces the number of interviews and personal and business references to three each. It may seem extreme to some, but Dezember said the process works well for the precaster, which put the hiring system in place about 10 years ago. It has shown to find good fits right out of the gate, and it also gives candidates an in-depth view of the company's culture, processes and mission.

"Whenever we cut a corner, cheat or skip some steps in the hiring process, we get burned every time," Dezember said.

LET THEM PREVIEW THE JOB

Along with conducting a thorough interview process, Verchota recommends bringing candidates onsite to see the company's operations in action. When applicants take a facility tour and observe the work in person, they come away with a better idea as to whether they can perform those tasks.

"This is a self-selection process that puts the responsibility on both parties to determine whether you have a good fit between employer and employee," Verchota said. "It also ensures that candidates have an honest understanding of the work, the capabilities required and the expectations for the position."

"It's not enough to just hire someone, give them an employee handbook and have them sign on the dotted line to prove that they read all of the policies and procedures. For best results, you have to share expectations, give them a taste of the job they'll be doing, and use an onboarding process that sets them up for success."

THEN THE TRAINING KICKS IN

Atlantic TNG has new employees visit the NPCA website to review the more than 100 courses focused on training new and existing workers on the finer points of precast concrete manufacturing and business management. Based on the position, the company uses NPCA's safety, production and other webinars and training resources to help initiate and train new hires.

"There's always something for every job that we have here," said Kitchner, who incorporates NPCA's education into both individual and group training. "It's a great resource for us to use as part of our onboarding and training process."

The online training goes hand-in-hand with a thorough plant tour hosted by the company's production and safety managers.

"We cover as much as we can within an hour or two," she said. "That gives them a good start and an understanding of our whole operation."

The initial tour provides an overwhelming amount of information, and sometimes new hires do not yet have the background knowledge or context to digest everything they see and hear the first time around. So the tour should be repeated after a few weeks. This allows the new employees to apply context to the last couple weeks' worth of training and learning to what they're seeing and hearing again.

At StructureCast, all new employees go through a three-month training program and are paired with mentors who help them through that process via weekly meetings. The training can be extended and modules repeated as needed.

"At the end of three months, we wind up with an employee who is pretty well set up to improve the company from their point of view," Dezember said.

"For best results, you have to share expectations, give them a taste of the job they'll be doing, and use an onboarding process that sets them up for success."

— Bob Verchota, *RPVerchota & Associates*

KEEP THE PROCESS GOING

In today's competitive labor environment, the "set it and forget" approach to employee hiring doesn't work. Younger generations, in particular, require a steady flow of feedback, support and mentoring.

With up to 71% of young people in the workforce feeling disengaged from their jobs, and more than half of new employees expected to leave their current jobs within 12 months,² precasters should establish continuous, two-way feedback loops that include scheduled reviews and skill assessments that help workers, mentors and employers track progress and understand where they need to improve.

"In the plant, each shop has a quality control technician who is responsible for 10 to 20 employees," Kitchner said. "That technician makes sure employees are trained on the processes (e.g., knocking out a hole, pouring, finishing) according to a checklist."

The technician also monitors employees for punctuality, attitude and behavior, providing continual feedback to employees and managers in those areas as well.

This approach works for Atlantic TNG and companies that have taken a similar approach.

"We have a better group of employees than we had just a couple years ago," Kitchner said. "They take more pride in what they're doing, receive continual feedback and tend to get more excited about their accomplishments." ^{PI}

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

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PUSHING THE ENVELOPE



MBO PRECAST emphasizes quality, customer service and never backing down to carve a niche in the Northeast.

By Matt Werner / Photos courtesy of MBO Precast

Jeff Opachinski knew he had his work cut out when he purchased a concrete company from his father in the 1980s. He took over an operation that only had a handful of customers, a couple of forms and virtually no experience in precast.

After 35 years in business, however, MBO Precast is showing how a relative newcomer can carve out a place in a competitive market and succeed. A mindset of doing whatever it takes helped get the company off the ground and propelled it to the future.

SELF-TAUGHT PRECAST KNOWLEDGE

Opachinski grew up in the construction industry. His father owned a ready-mix concrete plant before branching out into precast.

When Opachinski was 23, he started manufacturing burial vaults and eventually took over the precast branch of his father's company, which at the time had one truck and two forms. Soon, MBO was manufacturing septic systems and leaching systems.

"There was a huge learning curve, because I had no precast background," said Opachinski, now president at MBO. "I learned a little bit on my own with the burial vaults. So, I knew a little bit about how precast worked, but everything was self-taught and whatever I could pick up."

Slowly, MBO began adding additional employees and product lines to



MBO opened a new facility in 2007, allowing the company to diversify its product line and expand operations.



MBO is a licensed manufacturer of Stone Strong products, which helped the company broaden its production capability.

expand its customer base. Opachinski knew it would be tough to break through the Northeast market, going up against many companies that had been in business for more than 50 years.

“We couldn’t compete with a neighbor who could produce 20 manholes a day,” he said. “We didn’t have the money or the equipment to do it.”

MBO began stockpiling as many products as it could, manufacturing as many blank manhole structures as possible. Doing so allowed MBO to appeal to customers wanting product as quickly as possible.

“That’s how I pried my way into the market that was pretty well saturated,” Opachinski said. “That really enabled me to get into other product lines and other facets of the industry, and we just grew off that.”

MBO then began adding new equipment, including an automated mixer system in the 1990s, which fueled further growth. Eventually, it became clear the facility had reached its capacity in terms of production space and would need to expand.

“WE WERE ABLE TO TAKE ON A LOT OF DIFFERENT PRODUCT LINES, THE BIG ONE BEING STONE STRONG. THAT REALLY BECAME A BIG STAPLE IN OUR PRODUCT LINE, OUR VOLUME, AND IT BROADENED WHAT WE WERE ABLE TO DO.”

– Jeff Opachinski, MBO Precast

MASSIVE UNDERTAKING

As he started planning what type of facility the company would need, Opachinski knew he wanted to build the biggest and best facility the company could afford. One solution was doing some of the construction themselves to save money that could be invested into better equipment.

The 12,000-square-foot facility opened in 2007 and was ready to propel the company’s growth further, but that year wasn’t kind to the construction industry as the economy collapsed.

“It was a big move, and then all of a sudden, the economy died,” Opachinski said. “We’ve been rebuilding ever since that.”

The move was about as tough as it could be, and the company struggled to get financing. Rather than seeing the experience as a negative, Opachinski remains positive.

“Thank God we did build it because it opened us up to all kinds of new work and products,” he said. “It was real touch and go, but we were able to do a lot of the state work, which is all there was when the economy tanked.”

The former facility housed a 10-ton crane and a 5-ton crane. The new facility features two 15-ton cranes, a 10-ton crane and a 5-ton crane. New equipment and innovative technology allow MBO to efficiently manufacture more product. A larger yard provides more space to stock product. A new mixer and batching system allow workers to be more precise with mix designs. Indoor storage bins for aggregate allow production to continue even through the cold Massachusetts winters.

“We were able to take on a lot of different product lines, the big one being Stone Strong,” Opachinski said. “That really became a big staple in our product line, our volume, and it broadened what we were able to do.”

GETTING THEIR FOOT IN THE DOOR

Pretty soon, MBO was taking on bigger projects and proving itself a major player in the Northeast. One of the first ventures that really put it on the map was a Cape Cod solar project that involved reclaiming landfills and the largest private solar project in the Northeast at the time. MBO produced precast concrete ballast blocks to support the panels.

Another project that drove expansion was a large Massachusetts Department of

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Projects that MBO has completed include retaining walls for local high schools, car dealerships and Massachusetts Department of Transportation.

"NPCA IS ASSOCIATED WITH QUALITY. ANYBODY THAT KNOWS ANYTHING ABOUT THE INDUSTRY KNOWS NPCA, AND IT'S A BADGE OF HONOR AND QUALITY IN OUR PRODUCTS."

— Eric Opachinski, MBO Precast

Transportation job that involved more than 1,400 precast concrete structures.

"We got our feet wet with some of the biggest clients in the area that were semi-untouchable because they had such long-standing relationships with other companies," Opachinski said. "We were able to get our foot in the door and prove that we could do the big projects."

Opachinski credits his team for sticking with him and getting through the downturn. He's proud that he never laid anyone off during those tough years. A large portion of his staff has been with

him for more than 25 years, and his son Eric is heavily involved in the business, managing the day-to-day operations.

"We've got a lot of guys with a lot of experience who have seen a lot and done a lot," Eric said. "That expertise really adds to what we provide for our customers, because a lot of experience goes a long way as far as getting a quality product out the door."

Eric and Jeff point to the employees' knowledge as a boost to the business, with most everyone working in production at one point or another.

"Everyone has gotten their hands dirty," Eric said. "When a phone call comes in, you have someone that can answer your question, no matter what it is. They're all experienced from being in the trenches."

This approach helps MBO show its employees that working there can lead to a career rather than thinking of it as a paycheck.

"We're always giving them goals and something to reach for," Eric said. "People that come to work here see that there's room for advancement and improvement. We try to instill that as soon as they get hired."

CULTURE OF QUALITY AND SERVICE

MBO also stresses the importance of quality and service in everything it does, and NPCA membership is critical to advancing those goals.

"NPCA is associated with quality," Eric said. "Anybody that knows anything about the industry knows NPCA, and it's a badge of honor and quality in our products."

Several employees have gone through NPCA's Production and Quality School, helping them advance their careers at the company and becoming a more integral member of the MBO team. That expanded knowledge creates a higher quality end product for the customer.

"Pre- and post-pour inspections are important to us," Eric said. "There's no margin for error – check, check, double-check. In the end, that helps us reduce waste and become more efficient."

"By doing all of that, you really have to pay attention to what you do and take pride in your work."

That pride keeps permeating once a product is shipped out, ensuring that every customer's need is met until the project is finished. Whether that's sending a short load to get a piece to the client quicker or having crew members on site to assist with installation, MBO places a premium on customer service.

"I really think the service end of business is where we really push the envelope, and that's why we are where we are," Eric said. "We just

really pride ourselves on taking care of the client, whatever they need. People don't forget when you do them a favor or get them the structure they need or if you help them in an emergency."

Jeff is quick to point to Eric's efforts on that front for the company's success – having more organization with quoting, following up on bids and even getting feedback on why they didn't get a job.

"Having all that information has really opened up a lot of doors for us," Jeff said. "We're really dialed in on that end of things, and that helps us. If we lose a project, now we know what it is, which helps us dictate where we spend our time on the next round."

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MBO manufactured a retaining wall for a sports complex in Massachusetts.

"I REALLY THINK THE SERVICE END OF BUSINESS IS WHERE WE REALLY PUSH THE ENVELOPE, AND THAT'S WHY WE ARE WHERE WE ARE. WE JUST REALLY PRIDE OURSELVES ON TAKING CARE OF THE CLIENT, WHATEVER THEY NEED."

— Eric Opachinski, MBO Precast

KEEP MOVING FORWARD

The 2007-09 Great Recession could have sunk MBO, but thanks to a dedicated staff and a vision for the future, the company pulled through. It took years to recover, but MBO did and has continued to enjoy growth all the way through today. By getting its foot in the door and pushing the envelope on customer service, Eric and Jeff see more opportunities in the future.

The father and son team always looks for ways to improve the business and seek out new directions. Moving forward, they're looking for ways to reinvest not only in the company but also in its employees.

"We're just going to continue to try and grow and do what we've been doing that got us here," Eric said. "We're going to push the envelope on quoting as much work as possible and not denying any possibilities."

"We're open to new customers, new product lines, and we're going to explore any and all options that we feel is in our capability." **PI**

Matt Werner is a former NPCA communications manager.

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then & NOW

Then & Now is a new series for *Precast Inc.* magazine this year. Each issue, NPCA will catch up with companies previously featured in what was then called *MC magazine*.

Gainey's Concrete Products

Photos courtesy of Gainey's Concrete Products

For this issue's Then & Now feature, NPCA caught up with Greg and Lisa Roache of Gainey's Concrete Products in Holden, La. Gainey's was founded in 1981 by Lisa's father, Richard Gainey, who died in 1994 following an automobile accident. At the time of the story, Lisa was two years into her role of leading the company alongside her mother, Jeanie, and three siblings, Lynette, Richard and Christopher. Lisa now serves as CEO, and Greg is president.



Lisa and Greg Roache own and operate Gainey's Concrete Products in Holden, La. Lisa's role in the company expanded overnight following her father's death. Greg soon after joined both Lisa's life and work.

Q: Can you believe it's been 25 years since that initial article in the Summer 1996 edition?

Lisa: It's just amazing how much time flies when you are having a lot of fun. It does seem like sometimes it was a lifetime ago. That was pre-children, and my kids are such a large part of my life. It is hard to envision how we were then.

We are coming up on our 40th anniversary at the company, and so we are doing a lot of reminiscing lately. Seeing where we came from when my dad started the company to where we are now, it's just really something.

Q: Lisa, you were 24 years old when you lost your father and were thrust into a leadership position at the company. You had three days to mourn before taking over day-to-day operations. How do you think about those first two years now that time has passed?

Lisa: Can you just imagine being 24 and inheriting a business? It absolutely changed everything, and I feel like (my father) would be so very proud from where we came. But sometimes, I'm not even sure if he envisioned it being what it is today.

One of my favorite things to do is walk around the plant when no one is here and just be in awe of how much we've accomplished through the years and the lives we've impacted and the lives that have impacted us.

Everything good and bad makes you who you are today, and so there were obviously lessons to learn. I needed to get a crash course in business, which is what I got. I'm very thankful for all the mentors I had through life and really, most of them have come through NPCA. People just absolutely embraced us. They helped us.



They would send people to help us. Talk and encourage us. Still do to this day.

Q: How did you two meet?

Lisa: We were on the NPCA marketing committee together in 1998, and actually (Greg) really annoyed me to be quite honest. I run a fabulous meeting, and he would just be zoned out, not paying attention. That's how we got to know each other.

After I went through my divorce, I had two little girls, and a mutual friend, Della McDonald, said we would be perfect together. My response: "Ah, I don't think so."


So Della sent a gift from Greg to me right after Valentine's Day in 2002. I called to thank him, and it wasn't a minute into the call that I knew he had no clue what I was talking about. I was so embarrassed. But he called back and said he was interested and said he'd send me a gift that's appropriate for him. He sent me a box with his 10 all-time favorite books, a mug for coffee and warm socks. This is the romantic gift from Greg. I read all 10 books, and we talked and got to know each other and got to be really good friends. After a year of dating long distance, he came down. I tell him all the time he just married me so he could be the girls' dad because he really fell in love with them. The rest is history.


Q: How has Greg's involvement changed the course of the company?

Lisa: Greg and I dated long distance for a year before he came here and joined the company. During that time, he would consult for us, and he would give Lynette, my sister, and I assignments. On the weekends, we'd do them, and he'd analyze them. When he was looking at our business, he said with every residential system that goes out the gate, we were losing \$100 because of the overhead involved. I'm like, "OK, we are out of that market. Let's see what else we are going to do."

Greg: That business, residential home sewage, was 51 percent of sales the year I got here. Without blinking an eye, she goes: "How are we going to get out?" I told her we are going to raise the price, and we are going to lose some business, but the business we keep will be profitable. But then we have to immediately replace what we lost.

That was a major switch from making all homeowner business products to business-to-business and using a traditional product line.






Thank you, Darryl!

ConSeal extends best wishes to National Sales Manager Darryl Cloud upon his retirement.

Darryl's impact is far-reaching and he leaves an indelible mark on our industry. Career milestones include:

- 2011 Robert E. Yoakum Honoree
- Member of NPCA Board of Directors, 2004-2006
- Member and chairman of NPCA Education Foundation, 2010-2018
- Associate representative serving OH, WI and IL precast associations
- 2015 boot camp to boot camp ride to raise money for the Semper Fi Fund for wounded Marines

Visit Darryl and wish him well.





Within six months of my getting here, we put together an operational strategy together. Last year, our home residential sewage treatment sales – which were 51 percent of sales originally – were less than a half of a percent.

Another change is that when I got here, they had a 100-foot-long building with no crane. They were pouring outside on the ground, in the rain with rubber tire forklifts. After a strategic assessment of the business in 2005, we hung our first crane and direct labor went down 43 percent. And then the series of expansions continued as we got out of the elements of Louisiana.

It came down to we needed to get out of a couple of things. Also, we needed to emphasize a couple of things. We were at a good point where we were moving from rural to residential to light commercial and industrial. Early on, there was a lot of growth here, but you are not going to make it without an efficient plant. In addition, we needed to learn to become really good contractors and become experts at wastewater. I would work here 12 hours a day and at night read textbooks on wastewater engineering.

The other thing I found was Lisa sat in her office and typically there would be 25 people lined up at her door to find out what to do for the

day. We needed company structure, different divisions and people in charge. We wrestled over this for a while, but we eventually went from a flat organization to running a layered organization. We created job descriptions and salary bands. We went from being an autocratic organization to getting advice from a committee. We now have an executive committee with seven people, including Lisa. They discuss weekly everything that has to be done, then she decides. It was an amazing transformation. Lisa is one of the most natural born leaders I have ever met, but when you grow up in a little family company, you really don't know anything other than what your instincts told you to do.

Q: Greg, how does Lisa remind you about what you've learned about her father?

Greg: When you think about what her father did for the sake of his family, it's remarkable. He was working in a shipyard by night as a welder and felt like he was going to get laid off. So, by day he would work on the business. I'm sure he didn't realize the risk he was taking on. He was just trying to find a way to feed his family. But that is a pioneer and an entrepreneur.

When I met Lisa, she was working seven days a week, and what they both had in common is they just had no quit. Her father refused to give up, and Lisa refused to give up through all the tough times.

Q: Lisa, you talked in the 1996 article about how NPCA's resources were a major source of ideas and knowledge for how you ran the company. How do you continue to interact with NPCA and its membership?

Lisa: I remember my first Precast Show in 1996 in Indianapolis (then called the Manufactured Concrete Products Expo). I was so nervous, being a young female and thinking I had to know so many things. So I studied, and I prepared.

So many people were so warm and gracious and helpful. It's been an incredible journey with the precasters and associate members along the way. The people who have become friends and have truly helped us.



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I think we are at the point now where we really enjoy giving back. All of my business skills came from NPCA and the mentorships there prior to Greg joining the company. We really like helping other people. We enjoy making those connections.

Greg: Lisa was the poster child of, "If you want to get value out of NPCA, then put time into NPCA." When I was on the board and on the marketing task force, I was actioned by both groups to call members and say, "Why aren't you coming to the meetings?" And the answer was always consistent: "Well, I'm the only guy who can fix the mixer. I've got trucks down." They felt they didn't have time to invest into

NPCA. It's a circular problem. The more you don't do, the more you dig yourself into the problems you have.

At the beginning, Lisa was desperate as anyone, but despite having no time and no extra money, she would travel to the meetings, sit in the classes and meet her fellow precasters. Now, either of us can pick up the phone and call 30 to 50 plants, and they will stop what they are doing and help us. And not a week goes by where two or three precasters ask if they can come tour, take a look at equipment we have, ask our opinions. It's not just going to the meetings for us. It's being connected with all the active member companies.

Q: What are your hopes for Gaiety's Concrete Products for the next 25 years?

Greg: Our dream is that this is sustainable. I'm 63. Lisa is 50. We want it to be a legacy business that will have a growth path way past our time. We built a team of executives here at Gaiety's that's less me, less Lisa or other family members. This company is on a very aggressive growth path now.

We did three capital projects in the plant last year and now doing one twice the size this year. We are growing by leaps and bounds.

We have a daughter (Lainie) who is a junior studying civil engineering. She has said that she wants to enter the business, and that will be good if she does. Our other daughter, Shelby, is ready to graduate from Tulane and looking at graduate school for psychology. And Andrew, our youngest at 16, is a major figure in our lives. Whether they in the end seek a role in the company or pursue their own dreams, we want them to have options. I also have two married children who live out of state. Ashley is married to Will, and they are living in Kentucky. Michael is married to Kayla, and they recently relocated to Minnesota with their two children, Jett and Skylar.

I feel over the years that we've made an impact on our community and the employees who have come through the door. Even though the hours of a precaster are long and can be strenuous, it doesn't seem to have negatively impacted our children at all. When they recount the stories of their childhood, they recount the time lovingly of the company and the time they spent here. Those are the things I'm most proud of here. **PI**



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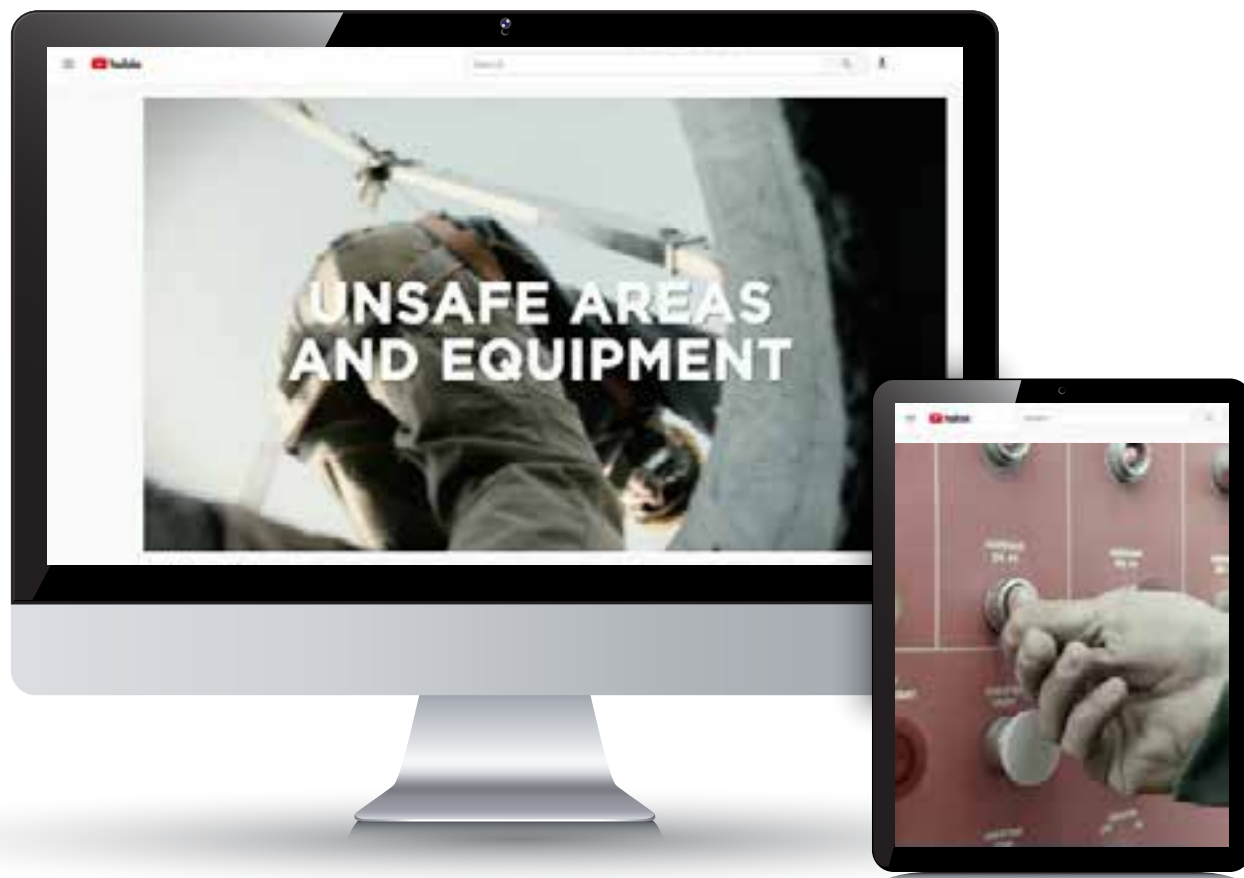
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Tools for Establishing a Strong Safety Culture

From a comprehensive video series to bi-monthly training topics, email newsletters and beyond, **NPCA has the resources** needed to establish and **maintain a safe work environment** at your precast plant.

By Mason Nichols

There are few one-size-fits-all solutions for precast concrete plants across the industry. Some plants manufacture a series of small, standardized products that primarily are used for underground work. Others concentrate on large-scale custom products for use in above-ground applications. And some boast complex, multi-faceted product lines that can meet the needs of seemingly any client or customer.

While precast plants vary widely in their offerings, one thing remains the

same: Safety is king. Without a strong safety culture, precast manufacturers and their team members cannot achieve consistent success.

For Jason Brewster, safety and compliance manager at Atlantic TNG of Sarasota, Fla., the National Precast Concrete Association provides considerable value in this area.

“When it comes to safety, a lot of collateral materials must be made,” said Brewster, who serves on NPCA’s Safety Committee and also chairs the Environmental Subcommittee. “As such, it’s nice to have a variety

of resources in a format that gives you a baseline from which to start. Whether it’s the NPCA Guide to Plant Safety or environmental Best Management Practices (BMPs), you can take the information and customize it, making it site-specific to suit your needs.”

NPCA’s resources provide precast plants with the information needed to highlight crucial safety topics and establish a strong safety culture. Not only does this result in protecting team members, but it can also instill confidence in your business.

WIDE-REACHING OPTIONS

Creating a safety program must work hand-in-hand with a plant’s production schedule. Often, the best place to start is with resources that benefit all team members, regardless of role or day-to-day responsibilities. This is where NPCA’s safety video series comes into play. The series includes six modules covering various safety aspects, including:

- General safety
- Production safety
- Unsafe materials
- Unsafe areas and equipment
- Cranes and lifting
- Powered industrial truck safety

Each video is 5-7 minutes in length and offers direct, easy-to-understand guidelines and protocols pertaining to specific topics – perfect for training new hires.

“At Atlantic, we took the production safety and general safety videos and plugged them in during our basic employee onboarding process,” Brewster said. “This gives us a nice baseline from which to start. It fills each new employee in on a lot of what to watch for, then we talk about specifics afterwards.”

The modules, available in English and Spanish, are designed for training new employees like Atlantic TNG does or as deeper dives into specific topics during toolbox talks and safety meetings.

NPCA’s Guide to Plant Safety is another wide-reaching resource that offers detailed safety information, covering topics such as confined space entry, fall protection, lockout/tagout, PPE and more. Each chapter contains a comprehensive topic summary, including terms and definitions, proper procedures to follow and applicable OSHA standards.

The guide also provides supporting documents and a training plan, allowing staff to engage more fully. Let’s say you’d like your team to focus on fall protection. Using the guide, you can leverage the training plan to develop multiple educational sessions. These sessions then can be used to reinforce important terms connected to the topic, stress the importance of crafting an emergency response plan or engage in a hands-on demonstration showcasing the proper means of attaching a personal fall protection system.

The NPCA Guide to Plant Safety is designed so businesses can add their company names to the training materials, effectively providing a plant-specific safety manual. The information can be used as a foundational piece that holds up on its own or built upon by adding specific information tied directly to a plant.

TARGETED RESOURCES

Dan Reinholtz, director of industrial sales and business development at Shuttlelift, has served on the NPCA Safety Committee for more than a year. During this time, he has worked on a variety of resources, including the safety video series. But it’s Reinholtz’s experience with rigging, lifting and cranes that has proven especially useful in creating topic-specific safety resources.

As Reinholtz said, the availability of targeted resources is crucial.

“I have traveled all over the U.S. and seen many precast operations,” he said. “There are many small businesses that do not have safety programs in place or provide the proper training to keep their employees safe.”

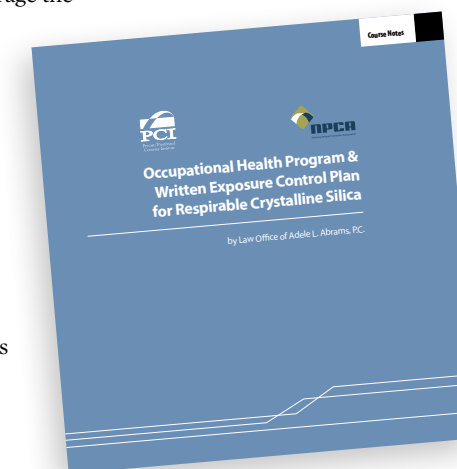


For some precast producers in the early stages of crafting a safety program, it may make sense to initially focus on a specific topic that is pertinent to operations. NPCA can help with those resources. One tool is the association’s safety training post, which publishes on the NPCA blog every two months.

The post includes a PowerPoint presentation developed by the Safety Committee that contains detailed information on the selected topic. Each presentation contains valuable information and links to other resources that provide further education and training. Recent topics include workplace violence awareness, small tool safety, hand safety and personal protective equipment.

Then there is Safety Express, NPCA’s quarterly email newsletter that deals exclusively with safety topics – articles, information and resources curated by the safety committee and NPCA’s professional staff. And it’s free for all members.

Another NPCA resource that focuses in on a specific topic is the Occupational Health Program & Written Exposure Control Plan for Respirable Crystalline Silica. This manual, developed in conjunction with the Precast/Prestressed Concrete Institute, contains everything a plant needs to identify the hazards associated with respirable crystalline silica and the steps to ensure that team members who work with or around silica are not exposed to hazardous levels of the material. The information, which spans 10 sections and more than 600 pages, is supplemented by an



accompanying video from NPCA and PCI – available in English and Spanish – to serve as an introduction to respirable crystalline silica compliance.

GOING ABOVE AND BEYOND

While many precast plants employ a safety manager or even a safety team, a company's size, complexity of day-to-day operations and ever-increasing workload can inhibit the generation of high-quality safety materials. That's exactly why the NPCA Safety Committee exists – to help every plant establish a strong safety culture.

“In a lot of plants, people end up performing multiple roles,” Brewster said. “If someone happens to be a shop lead but must also be the safety guy, it's really important to have resources like this to fall back on. Trying to create the wheel when you're also trying to do other things becomes way too much, and then things will get missed and people will be overwhelmed.”

The NPCA Safety Committee is valuable resource that gets out ahead of change but also reacts to each member's needs. Got a topic you'd like to see covered in more detail? Contact the committee. Interested in seeing a specific story published in Precast Inc.? Contact the committee. Member organizations can effectively use the safety committee an extension of their own staffs – drawing upon that knowledge and experience.

“The safety committee is made up not only of producers but also vendors and safety consultant companies that work within the industry,” Brewster said. “When you have more than just the view of

the guy on the ground at a plant, you get a more complete picture of what's going on.”

GETTING TO WORK

No matter the development stage of a plant's safety program, NPCA has materials and resources to enhance it. Resources delivered through a variety of formats and channels are designed to fit specific needs, all backed by the industry knowledge and workplace experience of NPCA Safety Committee members.

Visit precast.org/safety to access the materials referenced here and to learn more. **PI**

Mason Nichols is a Grand Rapids, Mich.-based writer and editor who has covered the precast concrete industry since 2013.

REFERENCES:

- 1 <https://www.osha.gov/data/commonstats>
- 2 <https://www.osha.gov/Publications/OSHA3146.pdf>
- 3 <https://www.osha.gov/top10citedstandards>
- 4 <https://www.osha.gov/fall-protection>



NPCA offers a wide variety of resources on safety topics such as its bi-monthly safety series and its safety videos available at precast.org/safety.

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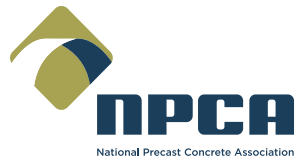
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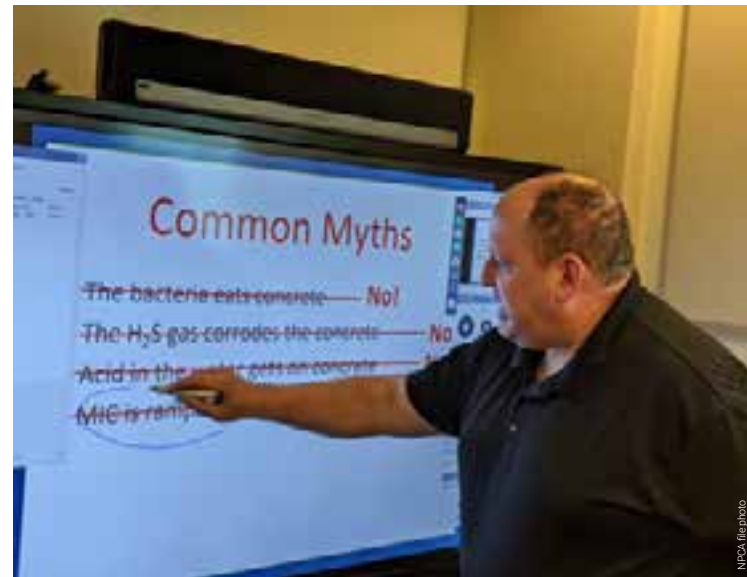
Working For You IN 2021

Continuous Improvement in a Virtual World

With travel restrictions and event cancellations ongoing, the NPCA outreach team continued to expand its virtual reach. NPCA implemented new processes and activities to cultivate a dynamic program that both meets academia's needs and brings staff members to virtual industry events.

Despite the obstacles, the outreach calendar is filling quickly with virtual presentations to specifiers and students, which has proven to be both time and cost effective. Virtual presentations also help increase NPCA's presence at industry trade shows and within the academic community. Other outreach activities, such as codes and standards participation along with certification and specification efforts, remain strong while operating in the virtual world.

As always, NPCA encourages members to get involved in outreach, and we will continue to provide opportunities to do so.



As COVID-19 travel restrictions continue within business and academics across the United States, NPCA has adapted its outreach program to focus on virtual connections.

Outreach Education

NPCA technical staff trained **425** specifiers and **380** students through **15** virtual presentations between January and April. NPCA professional staff members are slated to present both virtually and, potentially, in-person through the remainder of the year.

The outreach team revamped tracking abstract and topic submission deadlines for industry events in 2021, bringing precast education to a wider range of audiences while increasing the number of NPCA's first-time participation at industry events. This includes ASCE's International Conference on Transportation Development.

The 2021 Specifier Webinar Series kicked off in April and features four installments throughout the year. NPCA's 2020 Specifier Webinar Series brought in a record **2,063** attendees for the year – a number that we hope to surpass in 2021. The April installment was an exceptional start with nearly **800** live session attendees.

Here is the complete 2021 Specifier Webinar Series schedule (all webinars begin at Noon Eastern):

- **APRIL 15** – *Lifting and Handling Precast* presented by Clint Kilborn, Leviat
- **JUNE 22** – *Use of Precast Elements for Accelerated Bridge Construction* presented by Michael Culmo, P.E., CHA Consulting, Inc.
- **JULY 13** – *Essential Highway Infrastructure – Precast Retaining Walls in Transportation Works* presented by Ryan Berg, P.E., D.GE, Ryan R. Berg & Associates, Inc; Daniel Alzamora, P.E., FHWA; James Collin, Ph.D., P.E., D.GE, The Collin Group
- **DECEMBER 7** – *The Truth about Converting to Precast: Faster Schedules, Lower Cost, and Greater Resilience* presented by Cyndi Glascock, Gainey's Concrete

To learn more or to register for the remaining webinars, visit: precast.org/npcawebinars.

Trade Show Presence

Historically, trade show participation has been an important component of NPCA's outreach efforts. The association's presence at trade shows provides unique opportunities for staff to get a deeper understanding of local challenges and trends and to increase the visibility of precast by engaging attendees on a conversational level.

During the last several months, NPCA collaborated with design professionals to rejuvenate the association's presence at industry trade shows and develop several new trade show booth materials. The new design, expected to be completed by the end of the year, will allow NPCA to customize exhibit spaces to each audience – from transportation to onsite wastewater to NPCA Plant Certification and more.

Precast Days 2021

Precast Days is a weeks-long event during which members are encouraged to open their plants to their local communities to provide an inside look a precast concrete manufacturing. NPCA coordinates a national marketing campaign to highlight the events and showcase the opportunities for precast careers and construction using precast concrete.

Precast Days 2021 will take place during the weeks of November 1-12 and features new opportunities for member involvement. NPCA has put together a three-tier sponsorship package for members looking to show their support of national outreach efforts. The sponsorship benefits include recognition on the Precast Days registration page and logo placement in all print or digital advertisements as part of the national marketing campaign.



Precast Days is an opportunity for NPCA members to open their doors to their communities in order to showcase what goes on within the precast concrete industry.

Learn more about participating in Precast Days 2021 by visiting: precast.org/precastdays.

To learn more and take advantage of these opportunities to get involved in NPCA's outreach efforts, email Ashley Benson at abenson@precast.org.

Building Academic Relationships

NPCA's efforts to deliver precast concrete-related education in an academic setting go beyond conducting guest lectures and student chapter presentations. This year, the outreach team is sending resource packages to colleges across the nation to get resources and curriculum guides in the hands of students and professors. The "Faculty Care Packages" include technical resources tailored to each of the target programs (CIM, construction management, engineering, and architecture), scholarship opportunities for students, student and faculty membership information and more.

Building and maintaining relationships within the academic community is a focal point for NPCA's outreach program in 2021.

Stay in the Loop

NPCA's Working for You page is dedicated to keeping members informed on the association's past and upcoming outreach activities. The page provides weekly reports on NPCA's recent outreach related presentations, codes and standards, and specification development activities along with year-do-date metrics updated monthly.

Visit precast.org/working-for-you to stay in the loop between Precast Inc. quarterly publications.

Get Involved

A key component of NPCA's outreach program is creating and identifying ways in which all members can get involved, no matter the level of outreach experience or available resources. Here are a few upcoming or ongoing opportunities:

- ▶ **Join NPCA staff on a presentation.** Check out the Technical Services Representation listing (found on the Working for You page) to see if NPCA staff is slated to conduct outreach to your local audience or an audience with which you've been interested in connecting.
- ▶ **Send your leads to NPCA.** Members who identify opportunities to expand the visibility of precast as a material and industry can share those leads with NPCA. The outreach team will assist in making that connection to coordinate presentations or provide technical resources.



Students at Idaho State University get their hands dirty in and out of the classroom as they learn about precast concrete through a joint grant from the NPCA Foundation and PCI Foundation.

facilities is definitely something we are proud of, and it helps the students tremendously.

“Modular construction using precast concrete should not be limited to civil infrastructure but also critical infrastructure. The potential for precast concrete in both civil and critical infrastructure is significant.”

The four-year grant that continues through May 2022 provides the funding to support an annual four-semester program, two of which are dedicated to precast and prestressed bridges and two of which are dedicated

to precast culvert design, construction and seismic considerations. In addition to educating ISU civil engineering students, the school is partnered with the Idaho Transportation Department to support the proposal.

“We tailored it such that Idaho State would cover both above-ground and underground precast concrete sections,” Mustafa said.

Students also benefit from regional and national precast industry leaders, including NPCA, who supply online resources, guest speakers and in-person facility tours so the young, soon-to-be professionals can see actual precast manufacturing in person.

“Hands-on education is one of the best ways to learn,” said Bruce Savage, chair and associate professor of ISU civil and environmental engineering. “The design studio will allow us to strengthen the number of real-world projects in our curriculum. This will make our graduating engineers better prepared to the profession.”

Alongside the studio learning, Idaho State has been a regular competitor in national competitions, including earning third place in the NPCA Foundation Student Competition at The Precast Show 2020, where students were given real-world issues that precasters faced and are tasked with finding solutions.

“Having the opportunity to compete against other student groups

is big for us,” Mustafa said. “That way, students get not only technical and hands-on experience, but they actually get the opportunity to present in front of a panel of judges from the precast concrete industry to build up on their communications skills.”

Many civil engineering students graduate with a minimal knowledge of precast concrete, Mustafa said. That is changing at Idaho State.

“Precast is typically the last lecture in a reinforced concrete class,” he said. “We are trying to educate the next generation of students who can go on and

pursue a career in precast and serve the industry long term.”

The program is already paying dividends as some graduates have accepted jobs at precast companies and are already contributing to the work.

“Our goal is to have this class permanently up within our system,” Mustafa said. “We will continue to work with NPCA and PCI Foundations to achieve this.”

“We are trying to educate the next generation of students who can go on and pursue a career in precast and serve the industry long term.”

– Dr. Mustafa Mahal, ISU assistant professor

Setting a Concrete Foundation for the Future

Idaho State University is using an NPCA Foundation grant to provide a hands-on precast concrete studio for students to experience the industry.

By Joe Frollo

Engineering students at Idaho State University are getting a hands-on education in precast concrete thanks to a joint grant from the NPCA Foundation and PCI Foundation.

The Pocatello campus is home to a precast concrete engineering design studio designed to expose students to precast concrete manufacturing and its benefits.

“The studio class is very hands on, very different than a typical lecture class,” said Dr. Mustafa Mahal, an ISU assistant professor in the ISU department of civil and environmental engineering. “We have some fantastic laboratories for concrete and large-scale testing where we can have students mixing concrete, building specimens and testing full-scale concrete sections such as reinforced concrete pipes. Having these

NPCA FOUNDATION GRANT SUPPORTS NEW JERSEY INSTITUTE OF TECHNOLOGY

The NPCA Foundation also recently approved a \$60,000 grant for the New Jersey Institute of Technology’s (NJIT) Concrete Industry Management program.

Through close collaboration and input from industry partners, the School of Engineering and Applied Technology at NJIT will implement three new required courses and three new elective courses that will be integrated into the CIM program and School of Architecture.

Approximately 300 students from five majors will attend precast courses during their four-year degree programs starting in the fall. PCI Foundation also provided \$60,000 for the project, ensuring students and teachers will be exposed to all areas of the precast industry.

Partnerships between the NPCA Foundation and universities such as these help build the future workforce while educating students about the benefits of precast concrete. Learn more about the Foundation by visiting: precast.org/foundation. **PI**

Joe Frollo is NPCA’s acting director of communications and managing editor of Precast Inc.

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 plant. NPCA congratulates all the companies who 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.



Garden State Precast created a mobile app to expedite paperwork and leave supervisors more time to work with workers.



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 – open to both producer and associate members who are committed to excellence – 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 & Technology Committee, and the independent scores were tabulated to arrive at the following results:

1 First Place: Garden State Precast "QC App"



Garden State Precast made it a top priority to focus on in-house continuous improvement plans.

“This past year, one of our main focuses has been training with a new mobile app that we believe could be the new industry standard for the quality control departments of plants across the entire industry,” read the entry from the New Jersey-based company.

Garden State Precast worked directly with Titan developers to create a custom app for QC technician use. The previous system created paper forms and required manual data entry. The app replaced the old system with completed form scanning and

filling for all pre- and post-pour inspection checklists. Cumulatively, the old process consumed up to three hours a day. The same process today takes a maximum of 30 minutes.

Garden State Precast’s Best Practices Awards application said the hours they save using the new process allows QC technicians more time to directly supervise production and direct quality-related aspects around the plant. With the old paper system, QC technicians sometimes had to choose between their supervising duties or spending two to three hours on paperwork, sometimes requiring overtime.

With a streamlined electronic system, “When everyone else in the plant is finished, QC is able to follow them out the door soon afterwards,” Sean O’Malley of Garden State Precast reported.

“The technology is there, and you just have to have the vision to use it for the precast industry.”

2 Second Place (tie): Winchester Precast "Touchless Water Cooler"



Facing the same challenges every essential business did throughout 2020, Virginia-based Winchester Precast invested time and energy into strategies and practices that helped slow the spread of COVID-19 at the start of the pandemic lock downs. Like other precasters across the country, the company, “evaluated all facets of the work and identified a safety risk that had the potential to affect the health of employees.”

Namely: the water cooler.



To reduce interactions on site, Winchester Precast designed a touchless watercooler to help workers stay hydrated while reducing the chances for COVID-19 spread.

To reduce interactivity between workers, the plant manager designed a touchless watercooler that also housed a UV light to ensure safe disinfection even when the cooler was not in use. The system uses a standard 5-gallon beverage cooler, and the dispenser is equipped with a proximity sensor. The sensor detects the presence of a cup and tells the dispenser when to fill and when to stop the flow.

“I’m an industrial controls electrician,” plant manager Vince Juratovac said. “It was all about the safety of our employees to me.

“It’s totally portable and runs on a 12V lithium battery. Each charge delivers 50-80 gallons.”

In the heat of the summer, the company strategically placed three units filled with water around the plant. In adapting to the cold winter, the plant fills the container with hot chocolate.

As a result, plant managers have noticed that employees hydrate more often than usual. Leadership believes that it is the device itself encouraging employees to stay hydrated – all without a touch surface.

2 Second Place (tie): Smith-Midland Company "Gap Boards"



Smith-Midland employees post their ideas and solutions on Gap Boards, allowing all workers to help solve problems.



The employees at Smith-Midland (SMC) in Virginia are a storehouse of good ideas. To take advantage of that, SMC developed a process that allows employees to detail pain points and develop solutions that improve plant processes, a tool they call Gap Boards.

Gap Boards are visual charts that encourage employees to write down any problems they encounter, and the boards rename every problem an opportunity. The boards require employees to identify a root cause and designate a champion to implement the solution.

“The Gap Boards quickly became a great outlet for problem solving throughout the company,” SMC’s Matthew Smith said. “It’s used almost

everywhere: out on the plant, within the sales department and more.”

The Gap Boards have increased employee awareness and empowered them to identify opportunities for improvement. This employee empowerment and ownership has also improved employee morale. In addition, the boards have also helped employees exercise their problem-solving skills and improve inter-department communications.

“Interfaces between departments have improved due to ideas developed by the gap board, and openness on both sides to discuss root causes and solutions,” Smith said.

3 Third Place:
Forterra Pipe & Precast
“Reef of Opportunity”



In 2009, Forterra facilities in Florida began repurposing off-inventory pipe and precast for use as a fish habitat in the form of artificial reef material. Although Forterra already was engaged in crushing and recycling efforts, it was the Reef of Opportunity project that gained popularity recently with cities, counties and artificial reef organizations.



Sea life off the Texas coast now use Forterra Pipe & Precast materials for their habitat.

“This has been a very rewarding part of our work,” said Charles Piwowarski, Forterra’s area environmental manager.

In July 2020, Forterra’s Jersey Village, Texas, location provided 543 pieces of concrete pipe to Coastal Conservation Association of Texas and the Building Conservation Trust. The pieces were used to expand the 160-acre HI20 Reef on the upper Texas Coast.

Concrete pipe is durable and stable in marine environments, providing sustainable and long-lasting components for artificial reef building. It offers an effective base for biomass growth underwater and provides an intricate maze of hiding places for marine organisms.

The donated concrete structures serve as living habitat for a multitude of marine species, supporting conservation efforts along with recreational fishing while positively impacting local marine and boating industries.

HM Honorable Mention:
Hamilton Kent
“Test Coupling by Straub”



Hamilton Kent developed the HK Test Coupling by Straub with its Swiss-based sister company to provide an easy, safe and effective watertight joint test. By placing a tester centered over a joint, then securing and pressurizing, quality assurance personnel quickly can determine if a joint is watertight. The test causes no joint damage and requires no additional sealing of openings and no special equipment other than the test unit.

Hamilton Kent set out to reduce safety hazards associated with watertightness tests on some large structures and save time spent on sealing all openings in a system. Its test coupling is a simple procedure, simulates actual in-service pressure, is non-destructive, uses minimal water and no electricity and is reusable and affordable. The product helps precast concrete manufacturers save time and resources in their endeavor to prove joints watertight in a more sustainable way. **PI**

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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.



Darryl Cloud

Cloud retiring from Concrete Sealants

Darryl Cloud is retiring June 4 as national sales manager at Concrete Sealants.

Cloud has worked the past 31 years at the New Carlisle, Ohio-based facility. The 2011 Robert E. Yoakum Award winner, presented annually to an individual who has made significant long-term contributions to furthering the mission of NPCA and

advancing the precast concrete industry, is a member of the NPCA Engineering & Technology Committee. He also has served as a member of the NPCA Board of Directors, chaired the NPCA Foundation Board of Directors and sat on a dozen different NPCA committees, subcommittees and task forces.

Cloud is an adjunct faculty member at Indiana Wesleyan University and the University of Phoenix School of Business. Prior to starting his 49-year career in sales and marketing, he attained the rank of sergeant in the U.S. Marine Corps, serving during the Vietnam War. He continues to be active in charity events to benefit wounded Marines, most recently taking part in a six-week bicycle trip from San Diego, Calif., to Parris Island, S.C.



Max Cikerle

Schlüsselbauer Technologies names Cikerle as North American President

Schlüsselbauer North America has appointed Max Cikerle as the company's new president. Cikerle joined Schlüsselbauer nearly 10 years ago and will continue his role as the company's lead North American salesperson.

Companies rebrand to form Evercast

Four precast companies have rebranded themselves into the parent company Evercast, based in Princeton, W. Va.

American Block, Dellinger Precast, Eastern Vault and Seminole Precast, all of which are specialty precast and prestressed concrete

producers, will unite under the single brand nationally while maintaining their company names within their own markets.

Besser Promotes Kennedy, LaVigne

Scott Kennedy and Ryan LaVigne have accepted new positions with Besser Company. Kennedy, previously a technical service manager for pipe and precast, is now the vice president of pipe and precast. LaVigne is technical service manager for pipe and precast.



Scott Kennedy



Ryan LaVigne



Pardeep Sharma

ASTM International Honors Sharma

ASTM International Committee C13 on Concrete presented the Merlin G. "IB" Spangler Award to Pardeep Sharma for performing "outstanding technical work" during his participation and leadership on the C13 Committee. Sharma became a member of ASTM International in 2000, spending the last 12 years as the vice chairman for subcommittee C13.04.

Tindall Promotes Welborn, hires Smith

Tindall Corporation's South Carolina Division promoted Tim Welborn to plant manager. Wellborn is responsible for



Tim Welborn



Brant Smith

overseeing day-to-day plant operations, offer support to employees and implement and enforce safety policies.

Tindall's Mississippi Division has added Brant Smith as technical sales representative. With more than 20 years of construction sales experience, Smith maintains current customer accounts, generates new business and ensures customer requirements are met.

Kion launches veterans hiring program

Kion North America, based in Summerville, S.C., is partnering with Veterans Ascend to increase hiring opportunities for veterans and military spouses at its dealerships throughout the United States.

Job positions include service manager, service technician, traveling field mechanic, service support and business management.



HysterN30-45ZR/ZDR

Hyster offers new lift truck

Hyster Company now offers a lift truck designed for high-density, high-throughput warehouse environments. Available in 3,000- to 4,500-pound load capacities and single- or double-reach capabilities, the HysterN30-45ZR/ZDR narrow aisle reach truck delivers reduced energy consumption and faster cycle times to help warehouses move large inventories efficiently.

MAX USA Launches Lightweight Coil Nailer Promotion

Through Feb. 28, MAX USA dealers in the United States and Canada are offering promotional sales for the Plainview, N.Y., company's range of lightweight coil nailers. Designed for both professional and personal use, every product includes anti-double fire protection, lockout triggers, adjustable air deflections and low impact recoil to help avoid accidents.



MAX USA lightweight coil nailer

Combilift Launches Narrow Aisle Picker

Combilift's new Aisle Master-OP is a stand-on electric powered forklift that combines the advantages of a narrow aisle articulated forklift and an order picker for versatile operation in warehousing applications. The unit features a step-through operator compartment,



Combilift's Aisle Master

and the 11-inch floor height enables single-step access from both sides of the truck. With lift capacities up to 6,000 pounds, lift heights up to 39 feet and the ability to operate in aisles as narrow as 72 inches, it operates through a multifunctional programmable joystick control lever. ■

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March 3-5, 2022
THE PRECAST SHOW 2022
 Kansas City Convention Center
 Kansas City, Mo.



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



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

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ADVERTISERS INDEX

Abrasives Inc.	29
Afinitas	7, 60
All Erection & Crane Rental Corp.	25
ALP Supply	41
Besser Company	24
CF Metals Inc.	28
Cintas	11
Concrete Sealants Inc.	39
EJ	43
Haarup North America Inc.	2
Hamilton Form Co.	57
Hyundai Material Handling	47
iwi Concrete Equipment Group	40
Kraft Curing Systems Inc.	21
LTM Concrete	12, 54
MAX USA Corp.	34
Oklahoma/Iowa Steel & Wire Co.	35
Pennsylvania Insert Corp.	29
Precise Forms Inc.	36
Press-Seal Corporation	12
RoMix Inc.	4
Sioux Corporation	46
Solimar Pneumatics	17
Stone Strong Systems	33
Strike Products	13
Titan 3000 Precast Management System	59
Tucker's Machine & Steel Service Inc.	55
Wieser Form Fabrication	42

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 THE PRECAST SHOW

An IT Issue...and an Idea

Garden State's quest for a new business management system led to a relationship that changed the precast concrete industry.

Garden State Precast was just getting started when Kirby O'Malley realized they needed a new type of business management system. Kirby, his brother Gene and partner Dan Morris purchased the plant in 1999, and they were staring at an IT system that was clunky and antiquated.

"I needed to find somebody, and the precast industry didn't have anything," O'Malley said. They were looking for a vendor to help them wrap their arms around the accounting and IT side of the business. "We had bought some new computers, and the person who sold them to us knew James and Magda Muka," O'Malley said. "He told us, 'I know these people who are really smart and have a small company.'" That was the beginning of a long relationship that changed both companies, and, in essence, the precast concrete industry.

At the turn of the century, Muka Development Group was a small accounting firm focused in other business sectors in New Jersey and New York region. O'Malley introduced them to the precast concrete industry and asked whether they could develop some precast-specific software.

Immersed in the Industry

James Muka, a CPA, spent months at the Garden State facility in Farmingdale, N.J., learning about the industry. "He was watching what we did, and how we scheduled and how we did our engineering and takeoffs," O'Malley said. "So, he really immersed himself in the precast industry, and that's how we got started."

Fast forward 20 years, and Garden State Precast has a thriving business that runs exclusively on what is now known as Titan 3000 – a full-blown precast concrete plant management system used by precast plants throughout North America. It all started with an IT issue and an idea.

"We do everything on Titan," O'Malley said. "Credit, collections, all our receivables, all our invoicing. That's one of the things I like about it. It does everything – soup to nuts. We don't need a separate Excel spreadsheet for something. Everything is there."

Garden State Precast has worked extensively with Muka Development Group over the years in testing new modules. They are currently working on implementing the QCTitan mobile app at the plant, as the company continually moves toward becoming paperless. They've

already taken giant steps down that road. It started early on with a Titan accounting module.

"I had James come over to the plant and showed him all the paper we had," O'Malley said. "So, he developed a module and we got rid of 28 filing cabinets. We only have one filing cabinet left in the company. Everything gets scanned in, and it's all accessible. You can access it from your phone.

You can access it remotely, and that's been a big thing because so many of us work remotely now."

Customers appreciate it also, O'Malley said. "When we do our quoting, we can put it in almost any form that the customer wants. The data goes in, and we can bring it out any way they want. Our customers really enjoy the fact that we can customize it for the way in which they want to receive the quote. Same information. But some people like it one way, some people like it the other way. We can send it electronically. It's a modern convenience our customers really like, because our quotes are really easy to understand," he added. "It's always a good thing when your customers have confidence in what you're doing."

The team at the Muka Development Group would definitely agree with that statement!



Kirby O'Malley

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