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24 Champion Precast provides its clients with high-quality solutions.

On the Cover:
 The precast concrete outfall structure manufactured by Champion Precast for Black Shire Distillery in Gasconade County, Mo., weighs more than 50,000 pounds.

Photo provided by Champion Precast

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Questions from the Field

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

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

Chris writes:

Is 3D printing a technology that is used in the precast concrete industry?

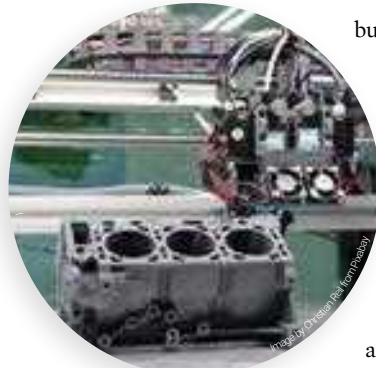
NPCA Technical Services engineers answered: Some plants use 3D printing to print forms or formliners. In terms of using 3D printing in manufacturing precast concrete, we are not aware of any NPCA member plants using the technology. However, the American Concrete Institute has formed a committee on 3D printing. ACI Committee 564, “3-D Printing with Cementitious Materials,” met for the first time at ACI Fall Convention 2018 and plans to bring together all stakeholders to discuss the many challenges and opportunities with this new technology. ACI Fall Convention 2020 plans to have a session titled, “Current Global Advances in 3D Printing of Concrete.” There are also some conferences focused solely on this technology. The Transportation Research Board is organizing and sponsoring the First International Conference on 3D Printing and Transportation on Nov. 20-21, 2019, in Washington, D.C.

So far, the majority of projects and examples using 3D printed concrete have been cast-in-place applications and not precast concrete. The NPCA Engineering and Technology Committee is monitoring this technology to determine its potential applications in the precast industry.

David writes:

Is there a cross-section and size recommendation for the butyl sealant used with butt joints? I have seen several cross-section shapes including square, rectangular, flat, and round, but none were specific to butt joints.

NPCA Technical Services engineers answered: There is no specific size calculation for the correct geometry of butyl rope sealants. Many



butyl rope manufacturers’ installation recommendations state the sealant should be compressed at least 50% from the initial height. Therefore, it is important to know the assumed maximum distance between the interface gap between the two joining concrete surfaces. If the space will be 1/2 inch, then the sealant rope should be at least 1 inch in height.

It is also important to note that typically rope sealant nomenclature corresponds to the equivalent cross-sectional area of a circular section. For example, a 1-inch rope sealant may not be 1 inch high when measured, but equivalent to the area of a 1-inch circular section which is 0.785 in². Therefore, a butyl sealant that is measured to be 1 inch tall may actually be called some value greater than 1 inch. Be aware of the sealant’s actual height/thickness and clearly specify within the specified provisions the furnished measured height of the butyl sealant.

Within rubber gasket design there is typically both a minimum and maximum allowable deformation. The maximum limit is established to ensure the gasket strain limits won’t be exceeded, which would lead to splitting, rubber deterioration, etc. However, this is not the case with a butyl rope sealant. When highly compressed, preformed sealants will typically have the ability to move laterally, a slightly larger sealant size should not be a problem. **PI**





Troubleshooting Cold Weather Concrete

By Kayla Hanson

Section 4.4.7 of the NPCA Quality Control Manual for Precast Concrete Plants outlines cold weather concreting precautions.

As fall comes to a close, many of us across the country have started preparing for winter by dressing in warmer layers or getting thick coats out of storage. We're also more conscious of the thermostat both at home and in the precast concrete plant. It's imperative throughout the year, and especially during times of seasonal transition, to remember how temperature change affects concrete and the materials used to produce it.

WHAT IS CONSIDERED COLD WEATHER?

Section 4.4.7 of the NPCA Quality Control Manual for Precast Concrete Plants outlines cold weather concreting

precautions. For the purposes of the manual, and in accordance with guidelines outlined in ACI 306, "Guide to Cold Weather Concreting," cold weather is defined as a period when the ambient air temperature of the casting environment meets the following conditions for more than three consecutive days:

1. The average daily air temperature is less than 40 F.
2. The air temperature is not greater than 50 F for more than one-half of any 24-hour period.

However, it is a best practice to begin using cold weather concreting precautions when the ambient

temperature is expected to drop to 50 F or lower at any point during production or curing. Precautions can be taken at each step of the manufacturing process including raw material preparation, form preparation, mixing, placing, finishing and curing.

WHY USE COLD WEATHER CONCRETING PRACTICES?

ACI 306 outlines five primary objectives for using cold weather concreting practices:

#1 **Prevent damage to concrete due to early-age freezing.**

Cement hydration reactions occur at a slower rate in cooler temperatures, which results in slower development of hydration products that give concrete its inherent strength, density and durability. It is imperative for fresh concrete to be placed at an appropriate temperature and protected from adverse temperature fluctuations throughout the production process, especially during curing. Fresh concrete with a measured temperature below 45 F at the time of pouring should be discarded.

Dry ambient air and low humidity from cold weather can increase and expedite evaporation of mix water from fresh concrete. Maintaining an adequate concrete moisture level and ambient relative humidity is important for proper curing. A critical degree of saturation is described as the point when a single cycle of freezing can cause damage to the concrete, which generally occurs when concrete reaches a compressive strength of 500 psi. Additionally, concrete allowed to freeze before reaching a compressive strength of 500 psi will never reach its full compressive strength potential. In fact, if concrete freezes prior to reaching 500 psi and is then cured in ideal conditions from that point forward, the concrete will not reach its design strength and its durability, resistance to freeze-thaw cycles, density and other attributes will be severely compromised. As a result, it is advised to discard any concrete that froze prior to reaching at least 500 psi. Additionally, any fresh concrete with a measured temperature before 45 F at the time of pouring should be discarded.

#2 **Ensure concrete develops the strength necessary for stripping the formwork and lifting and handling the product.**

Because concrete strength development slows at colder temperatures, a form stripped

after 18 hours in the summer or fall may need 24 hours or longer to cure before stripping in the winter.

Precast concrete products are engineered for the conditions they will experience in service, but their design must also account for stresses the product will endure during stripping operations as well as lifting and handling at the plant and on the job site.

In some cases, loads imparted on products during lifting and handling far exceed the most extreme conditions endured while in service. Therefore, it is critical to ensure concrete is allowed to reach the necessary stripping strength before removing formwork.

During colder months, allow additional time to cure in place before handling, if needed. Handling a product and inducing



5

Cold Weather Concreting Tips

[AT A GLANCE]

1. **Use heated mix water and/or heated aggregates, and always follow the guidelines set forth in ACI 306.** Be critical of concrete test results and trends during these times.
2. **Warm formwork, reinforcement and embedded items before casting.**
3. **Perform fresh concrete tests frequently and cast additional compressive strength cylinders for testing, if necessary.** The additional cylinders provide added opportunities to test the required limits.
4. **Pay particular attention to curing procedures.** Curing time, concrete and ambient temperature, and concrete and ambient moisture levels all require close monitoring.
5. **Be mindful of concrete and ambient temperatures during mixing, placing and curing.** Monitor the temperatures and make adjustments to the raw materials, production and curing practices as needed.



Covering curing products with tarps can help the product retain moisture. This is an especially critical step in winter and summer months.

NPCA file photo

stresses too early can damage the structure, resulting in lifting inserts pulling out and introducing serious safety concerns.

#3 Maintain curing conditions that promote strength development without exceeding the recommended concrete temperatures and without using water curing.

Skillful curing can bring out the best features of concrete. This includes enabling the concrete to reach its full potential in terms of strength, density and durability, and ensuring the product performs as designed. To help reduce the impact of low temperatures on cement hydration, concrete curing and concrete strength development, certain methods may be used to raise fresh concrete's temperature as well as the ambient curing temperature. However, there are tradeoffs as well as precautions that must be followed.

Some of the most common strategies to raise the temperature of a fresh concrete mix or concrete that was just placed include:

- **Heating mix water.** If warming the water to greater than 140 F, consider the batching order and adjust. It may be beneficial to mix the coarse aggregate and water prior to introducing cement to prevent the cement from flash setting.

Mix water should not be heated to more than 180 F.

- **Heating aggregates.** In most cases if the mix water is sufficiently warm, heating coarse aggregate beyond 60 F and fine aggregate beyond 105 F is unnecessary. Be mindful that rapid heating could cause some moist aggregates to explode if the moisture within the aggregate's pores increases in temperature too quickly. Heating aggregates could also cause the cement paste immediately surrounding the aggregate to set rapidly and inconsistently.

Avoid using frozen aggregates or aggregates with ice or snow accumulation. Not only will frozen aggregates introduce additional moisture to the fresh concrete mix, but they will also drastically lower the temperature of the mix which could slow or delay hydration. When possible, consider protecting aggregate storage areas from inclement winter weather with, for example, a permanent awning or temporary covering on outdoor aggregate hoppers, or store a portion of aggregate underground or indoors.

- **Creating a tent over formwork with tarps or sheeting and placing heaters inside the tent.** Gas-fired heaters are an effective way to warm the air surrounding curing products but must not be used to directly heat exposed or unformed concrete surfaces. The extreme heat can cause severe concrete carbonation or possibly delayed

ettringite formation (DEF). Drastically increased air temperature supplied by a heater tends to reduce humidity and accelerates evaporation of mix water. Since the corners and edges of a product are susceptible to freezing, extra care must be taken to maintain these areas of a curing product at an appropriate temperature.

- **Heating formwork and embedded items.** All forms, reinforcement and embedded items must be at least 32 F at the time of concrete placement. These items must also remain within a 25-degree range of the fresh concrete temperature at time of placement – specifically, forms, reinforcement and embedded items must not be more than 10 F cooler or 15 F warmer than the fresh concrete. Plants may use heated enclosures, electric blankets or other heating systems to warm these items to the necessary temperature.

No matter the approach a plant chooses to warm its mix, concrete shall not exceed a temperature of 90 F at time of placement. ACI 306 states, "Concrete placed at lower temperatures [40-to-50 F], protected against freezing, and properly cured for a sufficient length of time, has the potential to develop higher ultimate strength and greater durability than concrete placed at higher temperatures."

#4

Limit rapid temperature changes, particularly before concrete has developed sufficient strength to withstand thermal stresses.

When using steam curing, particular attention must be given to the ambient temperature inside the steam chamber as well as to the concrete itself. Extreme temperature fluctuations can shock the concrete and cause irreversible damage.

While working to prevent concrete from freezing before reaching a compressive strength of at least 500 psi, know that concrete should also not be exposed to accelerated curing methods using heat and moisture until after attaining initial set in accordance with ASTM C403, "Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance." Section 4.5.3 of the NPCA QC Manual states plants must establish an ambient curing cycle that ensures the ambient curing temperature does not exceed 150 F unless measures to prevent DEF are used. The rise in ambient curing

temperature must be limited to a maximum of 40 F per hour.

Additionally, rapid cooling of a concrete structure's surface or a drastic temperature differential between the product's surface and interior could cause cracking. A gradual cooling process is ideal.

#5

Provide protection consistent with the durability of the structure during its design life.

Precast concrete products are specified and designed with long service lives in mind. A high compressive strength is only one factor in ensuring a structure will endure its design life with resilience.

If certain measures are taken early in the curing process to expedite strength gain, other concrete characteristics could be compromised. For instance, calcium chloride works as an accelerator which may be beneficial in cold months, but use of chloride-containing admixtures in steel-reinforced concrete is not advised as they can cause issues with corrosion. Heaters help maintain

a warmer ambient temperature, but can cause rapid drying of concrete if not used properly, resulting in cracks and decreased durability. Curing with steam can provide excellent results, yet careful attention must be given to the ambient and concrete temperatures throughout the curing process or the concrete could be subjected to thermal shock.

COLD WEATHER CONCRETING IN YOUR PLANT

Proper curing is not a one-size-fits-all process. The ideal curing time, temperature and moisture strategy will not only vary from season-to-season, but it can also vary day-to-day. Short-term production convenience should not be prioritized at the cost of long-term strength or durability.

Now is an ideal time to review cold weather concreting procedures in your plant and potentially increase the frequency of tests to ensure quality and consistency in raw materials, concrete and final products. **PI**

Kayla Hanson is NPCA's director of technical services.



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ONE THING

PRECAST PRODUCT TRANSPORT

By Eric Carleton, PE.

Editor's Note:

This is the final article in a series that focused on the details and more technical aspects of one common thing precast concrete producers do on a daily basis.

The American Concrete Institute and other industry organizations define concrete transport as the movement of fresh concrete. Though this is an important aspect of production and was highlighted in the second article of this series, precasters should also think of transport as it relates to the movement of hardened concrete products. From the time a product is stripped from its form to when it arrives and is placed at the job site, there are three specific transport movements that require careful consideration: plant to yard, yard to truck and truck to installation site. Abiding by best practices throughout each step will ensure a product's quality and appearance are preserved.

PLANT TO YARD

Efficient and profitable precast operations turn forms at least once, sometimes twice, within a 24-hour period. Movement of hardened precast can be a precarious process, particularly just after stripping and during other early-age transportation processes.

Concrete strength development

The product movements immediately after stripping are critical in the life of every product. The concrete has attained sufficient strength to strip the form, but the concrete is still in the early stages of the hydration process and has likely not reached design strength. Every plant-specific quality control manual should outline a minimum stripping strength for each product that takes resistance to transport stresses into consideration. Products cast with typical wet-cast or self-consolidating concrete mixes are usually considered ready to be transported to the yard for storage after the product has been stripped. It is critical to know the concrete strength exhibited at this stage is only a function of hydration of the cementitious paste. The bond between the paste and aggregate may be minimal. Consequently, though this concrete may have met the minimum stripping and yarding compressive strength, it still is unlikely to possess its design tensile and flexural strengths. Lifting and transporting a product too soon – before allowing it to develop greater resistance to tensile and flexural stresses – can lead to unexpected spalling or tensile cracking.

Lifting devices

If initial product transport will rely on embedded lifters, evaluate the individual capacity of the lifting inserts at this early stage of concrete strength development, not the anticipated 28-day strength. In some cases, use of additional lifting inserts may be required to reduce the stress at each pick point.

Minimum steel requirements

Minimum reinforcing steel area requirements for many precast products fabricated under ASTM or DOT standards are based on the installed conditions rather than the transport or handling loads. Handling loads are a consideration for the precaster or contractor, typically not the project engineer. Thus, it is the responsibility of those parties to ensure adequate structural capacity for product lifting, handling and transport is built into the precast product's design.

For example, within ASTM C1577, "Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD," there is a series of tables showing the steel area requirements for various standard precast concrete box culvert section spans, rises and



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wall dimensions. The assumed loading conditions that were used to develop these tables are described within the appendix at the end of the standard. Figure 1 shows a free body diagram of the assumed soil loads acting on a backfilled box section. Figure 2 shows the same box loaded during transport, either with lift truck forks placed on the inside or with lifting inserts placed in the top slab. Alternately, Figure 2 also shows the loading condition with lifting inserts placed in the top slab. The loading conditions within Figure 2 vary greatly from the assumed design condition in Figure 1. The conditions shown in Figure 2 could cause the product to experience loads during transport that may not be included in the minimum steel requirements of ASTM C1577 for the installed condition in Figure 1. Without additional handling steel, cracking could occur within the top slab near the haunch, outer crown surface or other

places. A similar analysis can be seen for the precast manhole riser sections within Figures 3 and 4. Precasters must be cognizant of these unique transport loads, particularly for newly cast concrete. Certain lifting and handling conditions may require additional steel or a very specific placement policy for lifting forks or embedded lifting inserts. Proper lifting practices must adhere to the lifting plan for which the product was reinforced. When training plant personnel, it's important to not only teach the correct procedures but also explain the reasons behind them.

Dunnage

Careful consideration should also be given to dunnage selection and positioning, since proper dunnage is responsible for maintaining

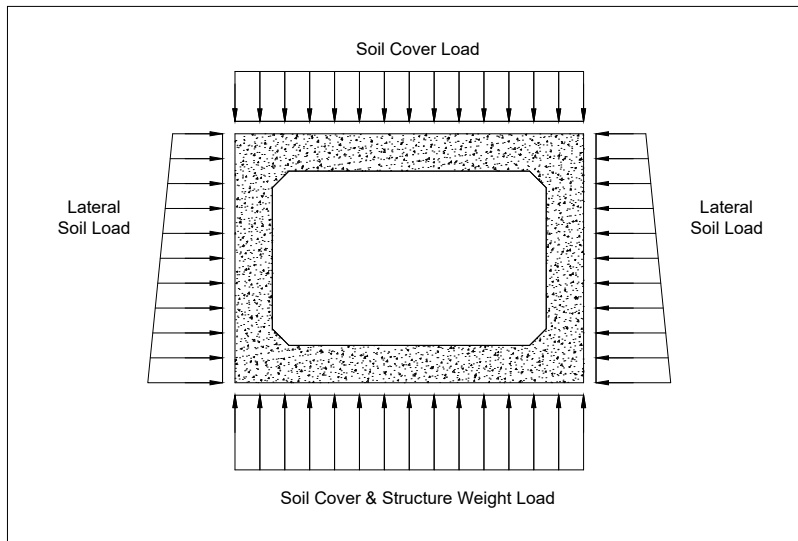


Figure 1: Box Culvert Installed Loads without Live Loads

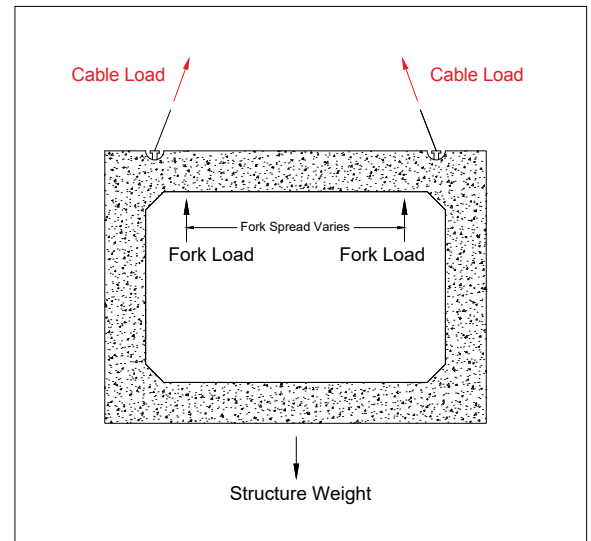


Figure 2: Box Culvert Possible Handling Loads

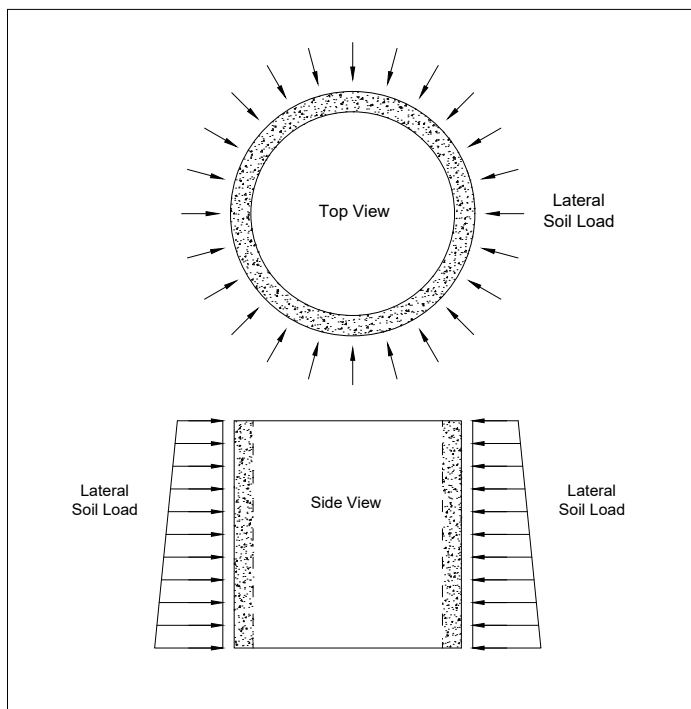


Figure 3: Manhole Riser Installed Loads without Live Loads

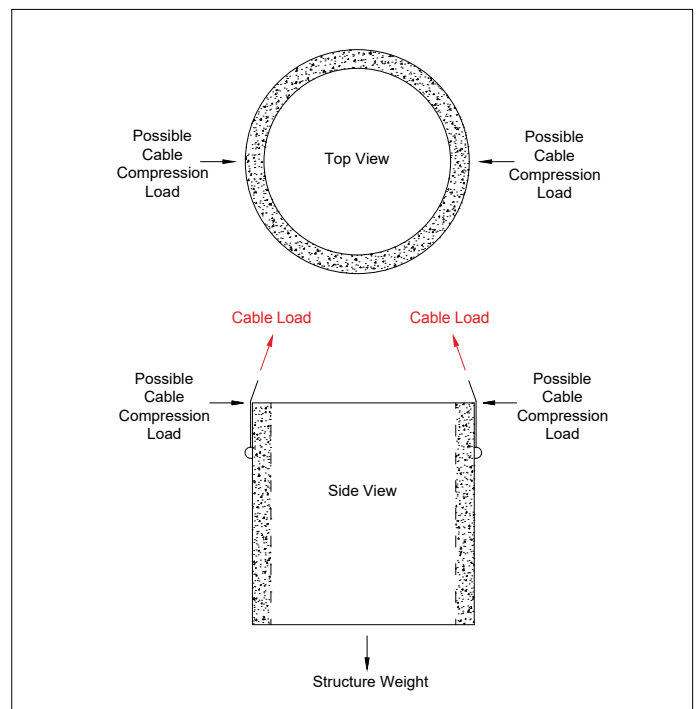


Figure 4: Manhole Riser Possible Handling Loads without Live Loads

product quality while in storage. For more information about dunnage read the 2018 Precast Inc. July-August article, "You're Never Done with Dunnage," or view The Precast Show 2017 presentation, "Dunnage, Loading & Shipping," located at precast.org/dunnage.

YARD TO TRUCK

After spending some time in the storage yard, the product will be transported to a truck or trailer for delivery to the installation site. By then, the product has had additional opportunity to cure and increase its compressive strength closer to the design levels. With improved aggregate-cement bonding, the product should be more resistant to spalling and cracking.

This is the last opportunity to ensure the product is ready for contractor handling. Many precast plants use forklifts or special hydraulic clamps to transport product within the plant or in the yard, but the contractor will typically use an embedded lifting device with appropriate connecting hardware, specific lift holes with lifting pins, or an embedded lifting cable and chains with hooks. If the contractor will use a lifting method that is different from the plant's method, problems could occur in the field.

Though the lifting insert and positioning are verified during pre- and post-pour inspections, lifting procedures



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should also be carefully monitored to ensure products are being lifted safely and uniformly.

Consider the following critical items during each inspection:

- ▶ **Embedded lifting inserts:** Is the correct lifting insert being used? For example, was the 5-ton capacity lifting insert embedded rather than the 8-ton capacity lifting insert? Is the recess area free of debris or ice? Is the insert installed properly or will it prohibit easy use in the field?
- ▶ **Lift holes:** Are the cored or cast holes adequately sized to accept the contractor's lift pin? Are there any obstructions in the opening that would prohibit use?
- ▶ **Embedded lift cable:** Is the cable kinked or damaged? Is it corroding?

In order to conduct these inspections properly, it's important to confirm the receiving contractor has the proper lifting and handling hardware on site to correctly transport the product off the truck and throughout the project site. Many precasters choose to provide appropriate lifting devices either as a service or for a fee. If this is the case, ensure there is a policy that all provided items are inspected, in excellent condition and comply with current OSHA or regulatory provisions. Lastly, if these items are furnished by the precaster, make sure they are loaded on the first truck arriving at the job site.

TRUCK TO JOB SITE

The driver plays a critical role in ensuring the product arrives undamaged to the job site. The driver must be well-informed. Whether the driver works for the precaster or an outside company, they need to know the DOT requirements for proper load tie down and should be trained to understand the basics of concrete loads, lifting and handling. A well-informed and trained driver may provide guidance to the contractor on proper handling and would be able to report back to the precast company if poor on-site product handling is observed.

Precasters should consider implementing written requirements within their QC plan for the use of chains, cables or strap guards on the precast products whenever these items encounter concrete corners, edges or joints. Even the most carefully secured product is subject to dynamic loading as the delivery truck bounces and flexes during the trip to the job site. The use of guards distributes these loads to reduce spalling or broken components and could be the difference between product acceptance or rejection on site. For more information about product load securement read the 2019 Precast Inc. July-August article, "Maintaining Load Securement Across Your Fleet."

ONE THING?

Precast concrete product transport is comprised of three distinct movements, each having specific considerations and challenges that need to be analyzed and addressed to furnish the best quality precast concrete product possible at the job site. Like most aspects of precast production, transport best practices boil down to having two things: knowledge of what is required and continuous training. **PI**

Eric Carleton, P.E., is NPCA's director of codes and standards. He is an ASTM Award of Merit recipient and currently serves as vice-chairman of ASTM C13, Concrete Pipe.

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REVAMPING TOOLBOX TALKS

By Alex Morales, M. Ed.



Toolbox talks can be an important part of your safety arsenal. Here are tips to help make your next one even better.

The origin of the term “toolbox talk” is difficult to pinpoint. An early 1940s reference in the magazine Safety Education describes a play written by W. F. Caldwell titled, “Fairyland Weekly Toolbox Meeting,” as a novel way to present a weekly safety meeting.¹ The term has clearly been used for a long time, but no one has been able to verify its first use or originator. Even anecdotes in the construction industry state it began on a construction site with a crew starting a shift and chatting about the day around their toolbox, but those tales have never come with much specificity. However, even as referenced by Caldwell, it is widely accepted that a toolbox talk is a safety-related meeting.

Today’s toolbox talk is a discussion targeting one specific safety issue. Other terms have been used in the construction industry to mean the same thing, such as tailgate meeting, safety short or crew briefing, but toolbox talk is the enduring term we use in the precast concrete industry. It is a short, informal meeting with employees completing the actual work. While daily project progress meetings may involve owners, management or office employees, toolbox talks are focused on plant-floor employees directly involved in the precast concrete production process.

If you have a lot of content to cover, consider making it into two parts and save some material for the next meeting.

PLAN THE TOOLBOX TALK

Toolbox talks are meant to be informal but, if you’re leading the talk, don’t let the informality fool you. You must still plan for a toolbox talk like you prepare for every business meeting. That might seem counterintuitive, but it’s important to be clear about the desired outcome of your toolbox talk in order to achieve it. If you want to ensure your crew understands the dangers of airborne silica, then you need to read the respirable silica standard first. If you want to teach everyone how to climb a ladder safely, then consider identifying someone who will demonstrate proper three-point contact while ascending or descending an actual ladder. If there’s an enforcement deadline looming for a new OSHA rule, obtain the new OSHA mandate to distribute. If you know an industry video clip that can show an objective view of something happening in your plant, it’s a good idea to incorporate it into your toolbox talk.

The point is, don’t wing it. Your employees will spot your lack of preparedness immediately and will take that to mean the topic isn’t important. Know what you’re going to do, say, show or distribute prior to the meeting and plan to do it in the proper amount of time.

Toolbox talks should be relatively short, 15 minutes or less, so plan

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Adult Learning Theory

There are myriad studies proving adults learn very differently than school-aged children. Some principles of adult learning are critical to follow during informal toolbox talks in order to make them effective.

- **Context** – Adults want to know why specific content is being taught in the first place. Make it clear why you chose today's toolbox talk topic.
- **Meaningfulness** – Adults like to synthesize new knowledge in terms of their experience. Convey during the toolbox talk why the topic pertains to them personally.
- **Dialogue** – As they synthesize new information, adults typically like to talk about their experience and bring new perspectives to a discussion. Let your employees participate in the toolbox talk.
- **Timeliness** – Adults have little time to learn something new for its own sake. Beyond pertinence, the new information must be useable in the very near future. How can they use the content today?
- **Safety** – Adults need to believe that their learning environment is a safe place to speak. Because adults bring with them their life experiences to contextualize their learning, anything that frames their participation as silly or dumb attacks their personal experiences. Validate everyone's comments during the talk.

accordingly. You need to get the point across, give your crew time to talk about it and get them back to their jobs knowing to work safer. If you have a lot of content to cover, consider making it into two parts and save some material for the next meeting.

TALK, DON'T TELL

Don't let your toolbox talk turn into the dreaded toolbox "tell". Yes, time is limited – toolbox talks are usually held at the very beginning of the day – so it's not necessarily the ideal time to have long dialogue. This is more reason to plan properly and ensure you don't have too much material to cover.

In addition to portioning down your content, you have to be comfortable having a conversation with a group. It is recommended not to ask closed-ended questions. For example, "Does that make sense?" might be important to verify, but it's also a question with a one-word answer.

Identifying your toolbox talks as a time for conversation isn't just a good idea, it's sound adult learning theory. Adults simply learn better when they speak about their experiences rather than when they listen to yours. There are better ways to ensure your team understands the content of a toolbox talk than just asking a yes/no question:

- ▶ Tell us about your training last week on the new OSHA standard.
- ▶ How can you recognize a potential silica issue?
- ▶ What can you do when you see someone without PPE?

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LISTEN

The idea behind preventing a toolbox “tell” is the facilitator should not be the one doing the talking. Your work was to plan the content. Your role during the toolbox talk is to facilitate conversation ... and listen. Employing active listening techniques is key when you facilitate a toolbox talk, so you don’t talk the whole time.

Two key principles of active listening are deferring judgement and responding appropriately. Deferring judgement is important because there’s no better way to sabotage your meeting than by making someone feel they’ve said something wrong. Preserve the safe zone of your toolbox talk by inviting all perspectives to the conversation and validating them all as important. Plus, be authentic yourself. If you don’t know the answer to a question, don’t guess. Saying something untrue or making the conversation uncomfortable will deter someone from participating in a future toolbox talk

Your role during the toolbox talk is to facilitate conversation ... and listen.

Active listening is important to facilitate healthy conversation and respond appropriately to your crew. Your plan should be for a 15-minute, stand-up meeting to include dialogue. Make sure everyone has a chance to speak. If someone is dominating the conversation, invite someone else to participate. Ask probing or clarifying questions about employee comments as they pertain to the topic of the toolbox talk. That doesn’t just prove you’re listening, but it also encourages focused conversation and increased participation.

PRACTICE

Increased participation during a toolbox talk is great, but you must manage it in order to stick to the allotted 10-15 minutes and get the crew out onto the plant floor to start or return to their shift. It’s a delicate dance to make sure everyone speaks, respond appropriately to comments to show you’re listening and end the meeting on time. The best way to master that dance is to practice. You might start with a simple outline:

- 6:00 a.m. – 6:04 a.m.** Announce new OSHA standard.
- 6:04 a.m. – 6:14 a.m.** Ask what is crew doing now.
Ask crew what they think they can change to comply.
Take notes for implementation plan.
- 6:14 a.m. – 6:15 a.m.** Thank crew, sign attendance sheet and close toolbox talk.

Toolbox talks don’t have to be daunting, impersonal meetings. In fact, they need to be pertinent discussions about important safety issues. If the team has questions that are beyond the scope of your planned discussion, table it until a future toolbox talk. There’s no better way to ensure an engaged audience than when participants chose the topic to discuss. **PI**

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

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MAKING INDUSTRY EDUCATION Affordable for All

Precasters can now train entry-level employees for about the cost of a good pair of steel-toed boots.

By Bridget McCrea

When Ron Sparks, general manager at Columbia Precast Products in Woodland, Wash., noticed NPCA had dropped the price of its Production and Quality School Level I online course to \$99 per student, it didn't take long for him to figure out how to take advantage of the great offer. Not long after that, the precaster incorporated the course into its employee development

program, knowing it would help accelerate the time it takes to get new hires up to speed, comfortable and producing high-quality precast concrete.

"We're facing the same issues that all precasters are right now in terms of finding and developing new talent," said Sparks. "We view PQS I as a good, entry-level educational opportunity. And now, we can get five employees through the course for roughly

the old price of one."

Once Columbia Precast Products' new hires go through an initial, probationary period, they must take and pass the course. To make the learning accessible, Columbia added two computer workstations in its lunchroom so employees can do their coursework. The workspace is also for employees and managers completing other online coursework.

With most employees completing PQS I after a few sessions, Sparks sees the online offering as a benefit for an entry-level employee who is coming onboard to work for a specific department.

“That person isn’t generally in the position to see or comprehend the entire operation and usually comes back and says, ‘Wow, I didn’t realize that there was that much to it,’” Sparks said.

The PQS I course also helps get new employees through the job initiation process faster than they would if they didn’t have that level of guidance.

“Most people spend the first 30-to-60 days on the job just trying to get acclimated and finding the quickest route to work in the morning,” Sparks said. “They’re not necessarily thinking about what’s going on in the rest of the company.”

The online course helps to fill that gap without putting any undue stress or pressure on the employee, who, upon completing it, can go back to getting initiated in his or her new job.

“They go back to their departments with a much broader vision of what we do here as a company and are able to focus faster on exactly where they want to put their effort,” Sparks said.

7,000-PLUS AND GROWING

It’s been about 25 years since NPCA first introduced its Production and Quality School to the industry. Because online learning wasn’t born yet, the courses were administered in a classroom setting to precast employees nationwide.

“The Education Committee at the time felt this would be a great way to provide fundamental, industry education on how to make good quality concrete,” said Marti Harrell, NPCA’s vice president of technical services and professional development.

Over time, those early efforts morphed into PQS I, which today stands as the organization’s flagship course. To date, NPCA has trained more than 7,000 individuals since it started tracking completion rates. The price change to \$99 was voted on by the NPCA Board of Directors to make it more affordable for a wider swath of members and their employees.

“They wanted to push this right to the shop floor and make it accessible to everyone,” Harrell said. “Previously, it was used more by senior, experienced production workers.”

The self-paced course is part of Precast University’s educational offering, which is a total of six classes. PQS II focuses on four specific areas (technical, production, quality and safety) and PQS III is a production leadership class. Once students complete all six classes, they graduate as Master Precasters. Since developing the program in 2012, more than 160 industry employees have become Master Precasters, or roughly 40-50 per year.

“That designation is a huge honor and source of pride for graduates, and it all starts with PQS I,” Harrell said.

TEACH US SOMETHING NEW

Harrell has seen everyone from the brand-new employee to the veteran manager take PQS I, with both ends of the spectrum taking value away from the educational offering.

“This is such an important part of the industry,” Harrell said. “If a precaster doesn’t have trained, knowledgeable workers producing quality concrete, then little else matters.”

In some cases, veteran employees are skeptical about the course’s ability to teach them something new. That skepticism is generally dispelled as soon as he or she logs into the system and starts interacting with the course content.

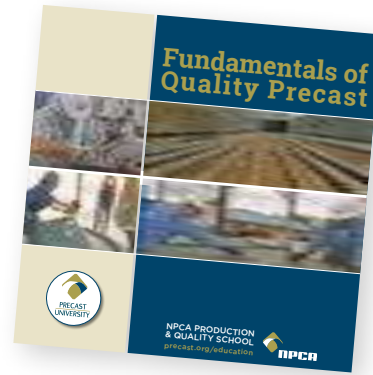
“I’ve seen people who have been in the industry for 20 years take it because their bosses instructed them to,” Harrell said. “They come out the experience saying, ‘Gosh, I really learned something new and picked up several things that I wasn’t even aware of.’”

This anecdotal proof just goes to show how even a basic, introductory course can be worth going back to once you’re a seasoned professional.

“It really is an important class regardless of someone’s level of expertise and experience in the industry,” Harrell said.

MEETING QUALITY CONTROL STANDARDS

For smaller precasters, online education that’s both relevant and affordable can mean the difference between employing uninitiated workers and having people on your team who



truly understand what they’re doing and why they’re doing it. Also, many of those employees learn from those who came before them, so they aren’t exposed to outside training sources.

“A lot of our precasters are mom-and-pop shops, so when they bring in training from an outside source like NPCA, they get a different viewpoint on

industry best practices,” Harrell said.

By infusing an independent voice into early training and employee onboarding – much like Columbia Precast Products is doing – precasters gain access to coursework that is based off the NPCA Quality Control Manual for Precast Concrete Plants.

“If you’re working towards certification, this class is actually required as part of that,” Harrell said. “Employees who take the PQS I class and follow the processes outlined in it should do really well when it comes to meeting quality control standards.”

TAKING PQS I AT THE PRECAST SHOW

As with any educational opportunity, PQS I also presents interesting new networking opportunities for students who attend the course at The Precast Show. In fact, Harrell sees this component as one of the most important takeaways for professionals who have taken the course.

“It’s a live class [at The Precast Show], so there’s always an opportunity to make connections with other people who have a similar job, but in a different part of the



Columbia Precast Products added a computer station in its lunchroom so employees can complete online training.



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world,” Harrell said. “That gives you the chance to pick up the phone and say, ‘Hey, I’m having this trouble with my mix design. How do you guys handle this?’ That’s really a valuable piece of the puzzle.”

The entire PQS series was developed by professional engineers who have 30-40 years of experience in the precast concrete industry, making it a solid choice for training.

“The course developers were responsible for running precast plants, consulting, doing quality inspections or even working for a DOT,” she said. “As a result, the content is really top notch and put together by people who know how to do this job really well.”

BOOTS ON THE GROUND

Ever since Columbia Precast Products moved to requiring PQS I, Sparks said the decision has paid off. Along with new workers, the company also required all of its existing employees to take the course, if they hadn’t already done so.

“It’s been great,” Sparks said. “We’ve had very positive feedback, and we’ll continue to do it.”

NPCA’s Quality Assurance/Quality Control Course is Now Online

As NPCA’s PQS Level I school has grown in popularity – particularly with the online course access – so have the organization’s PQS Level II courses. According to Harrell, the newest PQS Level II course to be launched online is PQS Level II Quality Assurance/Quality Control.

“This course is a natural extension of PQS Level I because it builds upon the fundamentals taught in PQS to explore how each component plays an important role in a quality finished product,” explained Harrell.

PQS Level II QA/QC is based on industry best practices including NPCA’s QC Manual, ACI, ASTM, and using data to monitor and evaluate trends.

“PQS Level II QA/QC is a great next step for any PQS Level I graduate, your QA/QC personnel, and those in the plant responsible for ensuring every precast product that leaves your plant is the hallmark of quality,” said Harrell.



Learn more and register for NPCA PQS courses at precast.org/precastuniversity.

To other precasters that might be considering a similar strategy, Sparks said most are struggling with similar issues: a tight labor market, the retiring Baby Boomer generation and the influx of younger generations into the workforce.

Courses like PQS I help to ease some of those pain points by getting employees interested, engaged, and productive faster –

all for an affordable cost.

“If you think about it, we’re basically investing \$99 in an employee,” Sparks said. “That’s pretty inexpensive, and about the same cost as a good pair of steel-toed boots.” **PI**

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

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NO BOUNDARIES

for Champion Precast

Editor's Note: The "Chairman's Choice" story features projects selected by Jon Ohmes, CEO of Champion Precast and newly elected NPCA Chairman of the Board.

By Mason Nichols // Photos provided by Champion Precast



Running a business requires establishing a delicate balance of hard work and dedication combined with flexibility and ingenuity. With these ingredients out of balance, operations can quickly go awry – but when you find the right combination, you’ll be well on your way to success. For more than three decades, Champion Precast of Troy, Mo., has provided a wide array of precast concrete products to customers throughout the Midwest. And while their commitment to providing high-quality solutions to clients has been ever-present, CEO Jon Ohmes understands growth only occurs when innovation and a forward-thinking mindset are included in the mix.

This mentality is exactly why Champion recently partnered with a local utility company to install more than 600 solar panels on top of two of its production facilities. Ohmes explained his company had considered adding the panels for quite some time. He even reached out to his network of precasters for advice, which included assistance from Greg Stratis, president of Shea Concrete Products, who installed solar panels at his plant in Amesbury, Mass., in 2013.¹ With all the information collected, Ohmes decided to move forward. The installed system will generate more than 255,000 kilowatt-hours per year, reducing energy costs at the plant by more than 75% and placing the company at the forefront of sustainable technology.

But adding solar panels is only one way Champion is looking to the future. While the company has found its niche providing utility products that function as a single-source solution for customers, Ohmes has found extreme value in breaking down two barriers which have historically limited precasters’ ability to expand – transportation and product weight. As these two projects highlight, remaining nimble in the precast concrete industry means seeing a challenge not as a hindrance, but as an opportunity.

PRECAST CONCRETE AT THE SOUTH POLE

More than a decade ago, a salesperson at Champion approached Ohmes with an idea. He wanted to ship a product from the heart of the Midwest to California. Ohmes was incredulous – he believed his company had no business dabbling in a project located so far away. But the salesperson convinced him to take a shot. Champion secured the work and successfully delivered on the project, reorienting Ohmes’ viewpoint.

“That job opened up my confidence,” he said. “I realized then that there’s no distance that can hold us back.”

From that point forward, he made it his mission for Champion to deliver to every state in the U.S. To date, the company has delivered to 37, including Hawaii. Yet even with Champion’s experience shipping



Champion Precast installed 628 solar panels on two production facilities. The panels can produce more than 255,000 kilowatt-hours per year.

CHAIRMAN'S
CHOICE

Champion Precast



Champion Precast's bid successfully met the project's tight timeline since deliveries to Antarctica are only accepted at certain times of the year. Champion Precast shipped 16 precast concrete products to the South Pole.

"I realized then that there's no distance that can hold us back."

— **Jon Ohmes**, CEO of
Champion Precast

products to unexpected locations, nothing could have prepared him for the request he received in 2017.

A salesperson reached out to Ohmes for help with bidding on what he claimed to be a unique project, but the products involved were standard. Ohmes questioned why the salesperson had contacted him for assistance.

"There were two different products on the project, but both were very simple," he said. "So, I asked him, 'What am I looking at here? What am I missing?' and he goes, 'It's going to Antarctica.'"

Champion worked diligently to submit its bid, going up against three competitors to secure the job. Due to extreme weather in Antarctica, deliveries could only be accepted at certain times of the year. Champion's bid on the project was the only one that would successfully meet the very tight timeline, and as a result, they were awarded the work.

Ohmes quickly realized in order to pull this job off, his entire team would have to work very closely together. He set the tone early.

"I've got a great staff," he said. "With that particular project, we went through everything



meticulously and looked at the dates. So it was, 'Production, you need to be ready here, shipping, you need to be ready here,' and so on.'

The team manufactured eight 4-foot-by-4-foot-by-2.5-foot precast foundation piers for the project, which involved the build-out of a prefabricated building located at the South Pole. Each pier weighed just less than 6,000 pounds. While the piers were simple in design, shipment required special packaging and custom pallets to ensure no damage occurred in transit. The piers were shipped in tandem with eight 600-pound precast grounding cylinders, each measuring 5 feet long and 1 foot in diameter.

Multiple steps were involved in the transportation process. Initially, the precast products were shipped via truck to Port Hueneme, Calif. From there, they were loaded onto a ship, where they made the 8,000-mile trip to the ice pier at McMurdo Station, Antarctica. Finally, the 16 precast pieces were loaded into an LC-130 military transport aircraft, which was used on the final leg of the journey to the South Pole.

While Ohmes sought to deliver to all 50 states, never did he imagine his company would ship internationally. He continues to describe the experience as a dream. Since then, Champion has delivered to Antarctica one more time, working with the same client.

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Champion Precast



“Our ability to solve the width issue on this project opened the eyes of owners and general contractors alike.”

– **Jon Ohmes**, CEO of
Champion Precast

BIG: THE NEW NORMAL

Years ago, Ohmes saw the trends in products getting larger. In response, he upgraded his equipment to enable Champion to handle products weighing up to 100,000 pounds. This decision has opened new possibilities for the business and has also helped the company become more competitive when bidding on projects. The result has also reconfigured what it means to have a big-pour day at the plant.

“On a regular day, we’ll manufacture pieces in the 40,000-pound range,” he said. “We don’t get too excited about it. We have to get to about 60,000 pounds before we consider it a critical load.”

That increased threshold was crucial for the work Champion secured with Black Shire Distillery in Hermann, Mo. The distillery, which is located about 80 miles

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west of St. Louis, required a large outfall structure capable of controlling the depth of an adjacent lake.

Champion worked closely with a local general contractor on the project, which originally called for a 24-foot-by-24-foot cast-in-place outfall structure. While the size of the finished product wasn't an issue for manufacturing at the plant, such a massive structure exceeded maximum roadway weight limits. The team at Champion had to devise an alternative solution.

"To make it work, we proposed a double precast concrete 20-foot-by-7-foot-by-12.5-foot outfall structure," Ohmes said. "The owner accepted it, but now we had to be able to connect the two pieces together for installation."

To do so, Champion designed each side with matching penetrations. The final product, which weighs more than 50,000 pounds, is capable of storing 30,000 gallons. A portion of the structure is exposed to visitors, so the team also designed it with a decorative rock facing. This helps maintain the desired aesthetic of the distillery while

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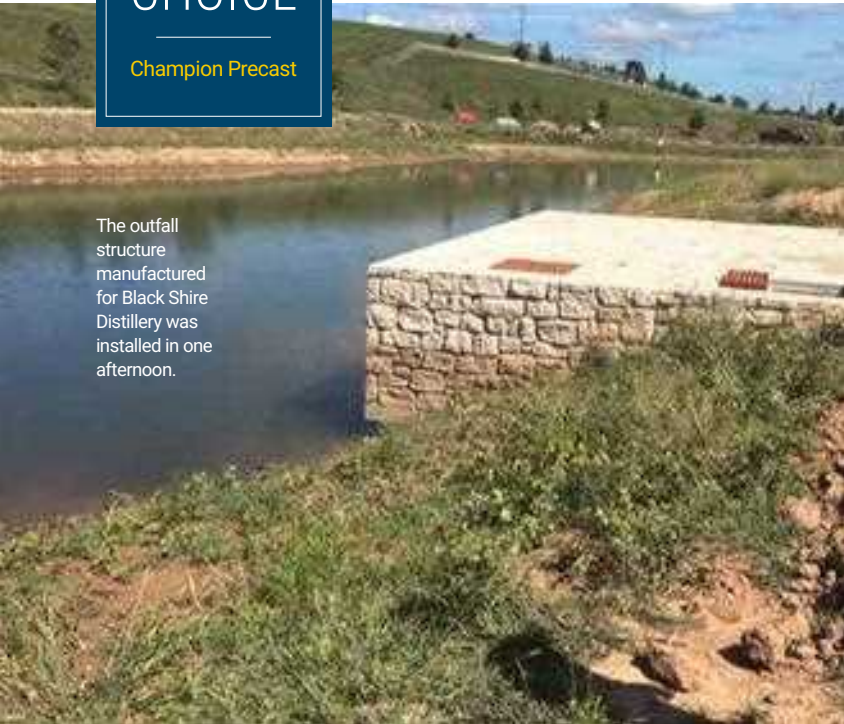
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CHAIRMAN'S
CHOICE

Champion Precast

The outfall structure manufactured for Black Shire Distillery was installed in one afternoon.



“There are a lot of things we can do that weren’t possible 10 years ago.”

– Jon Ohmes, CEO of Champion Precast

simultaneously captivating visitors. The top of the structure doubles as the location’s patio area and features a broom finish.

Despite the complexities associated with both the design and transportation of the outfall structure, installation was completed in one afternoon. Ohmes estimated the original cast-in-place solution likely would have taken 1-to-2 weeks. The quick installation afforded by precast helped save the general contractor money and kept construction of the distillery on track. For Champion, the work again proved the team’s ability to successfully navigate a diverse range of work.

“We can precast anything,” Ohmes said. “Our ability to solve the width issue on this project opened the eyes of owners and general contractors alike. Thanks to our flexibility in design and our increased lift capacity at the plant, they understand

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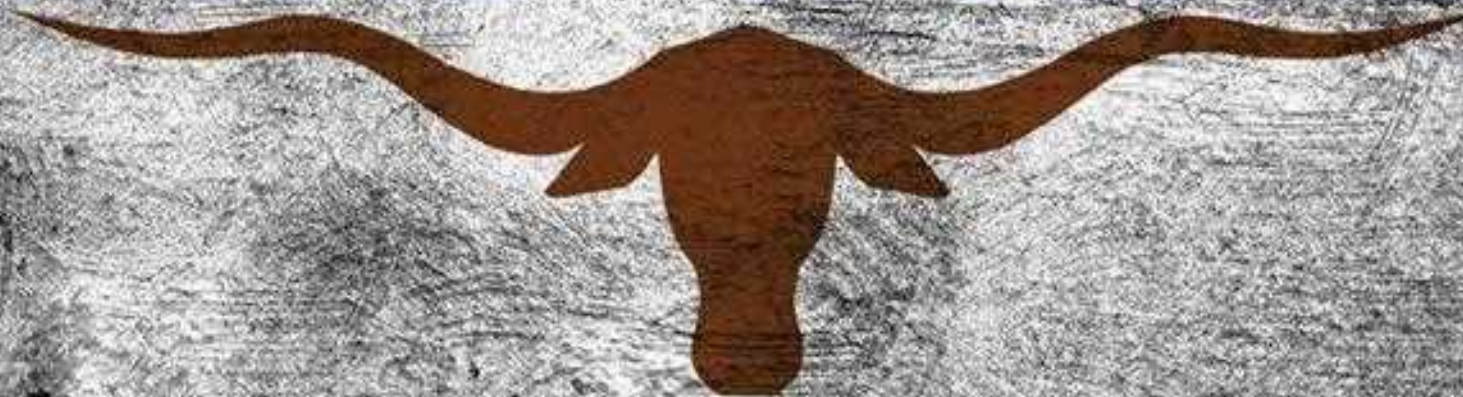
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that there are a lot of things we can do that weren't possible 10 years ago."

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While maintaining flexibility in design, production and transportation is important, Ohmes recognizes his people are his most important asset. He noted Champion Precast will only continue to evolve with the support and dedication of his team members.

"The people at Champion are proud of what they make," he said. "It's that family atmosphere – everyone knows everyone else – that continues to drive us forward, pushing us to continue to do more every day." P1

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

RESOURCES:

1 The solar panel system installed at Shea Concrete Products earned the company a National Precast Concrete Association Sustainability Award. <https://precast.org/2014/03/sustainability-awards-2/>

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Sustainability, Resiliency and the Precast Advantage

Demand for green and resilient building is on the rise in the U.S. – and that's **good news** for precasters.

By Shari Held

The Latitude luxury apartment complex in Arlington, Va., earned LEED Gold certification.



Photo credit: Lee Timenstein

Resiliency is not just a buzzword anymore; it's becoming a requirement in sustainable building design. And precast concrete is proving to be the material of choice because it offers long-term protection and resistance against the natural forces – such as storms and floods, hurricanes, tornadoes and high-winds – that plague the U.S. frequently.

For instance, the U.S. Green Building Council's 2018 World Green Building Trends report shows 13% of U.S. responders expect the majority of their upcoming projects will be green. And 50% of them believe the top demand will come from the green existing building/retrofits sector:¹

The USGBC also recently reported a 19% growth in LEED-certified residential (including multi-family residences) building since 2017. LEED-certified residences use 20% to 30% less energy,² and reducing energy consumption is the top environmental reason responders cited for building green.¹

“The most important reason to build sustainably is we have limited natural resources. We can't build things that will need to be replaced frequently. That's an unsustainable model.”

– Chris Grogan, *Smith-Midland Corp.*

The National Precast Concrete Association has reported on numerous projects that have obtained or are applying for LEED Gold certification and the numbers are growing. For example, Amesbury, Mass.-based Shea Concrete Products recently moved into a new 13,000-square-foot office, built primarily with precast. The company cited sustainability as a main incentive of precast and is working on obtaining LEED Gold certification. Two other projects that already attained LEED Gold are the MGM National Harbor hotel and casino in Maryland with 300,000 square feet of precast concrete and the Statue of Liberty Museum which features precast structural and exterior walls.

Here's another example of sustainable building practices in action.

LATITUDE LUXURY APARTMENTS

From the beginning, this 12-story, mixed-use high-rise in Arlington, Va., was on track for LEED Gold. Its building envelope of high-strength architectural precast concrete played a significant role in making that a reality.

“The most important reason to build sustainably is we have limited natural resources,” said Chris Grogan, business development manager for Va.-based Smith-Midland Corp., which designed, fabricated and erected the architectural precast panels for the job. “We can't build things that will need to be replaced frequently. That's an unsustainable model.”

Precast concrete was always part of the plan. The reflective, white precast panels on the building's

Smith-Midland Corp. manufactured 70,000 square feet of acid-wash finished architectural precast panels.



Photo provided by Smith-Midland Corp.

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*Gregg Jacobson, General Manager
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"Everybody worked together to achieve LEED Gold. This was definitely a design-assist job. Every job has challenges, but solutions are available as long as you spend the time to dissect them and come up with a solution as a team."

– Chris Grogan, *Smith-Midland Corp.*

facade minimize the urban heat island effect. Precast concrete's high thermal mass keeps the interior cool during the heat of the day. This makes the building more energy-efficient, so HVAC requirements are reduced. In addition, precast concrete is durable, has a long life cycle and is low maintenance.

"Using precast also minimizes or eliminates construction waste because most of the work is in plant-controlled conditions that are designed efficiently to minimize waste both at the plant, and by default, in the field," Grogan said.

Efficiencies in the fabrication phase

The concrete mix design originally called for using pigments. Later, the design team opted to use all natural materials. Smith-Midland was challenged to maintain a uniform color for the white acid-finish panels without using pigments.

"It required a lot of planning and a lot of different material selections to achieve it," Grogan said.

Recycled local materials were used in the concrete mix which also

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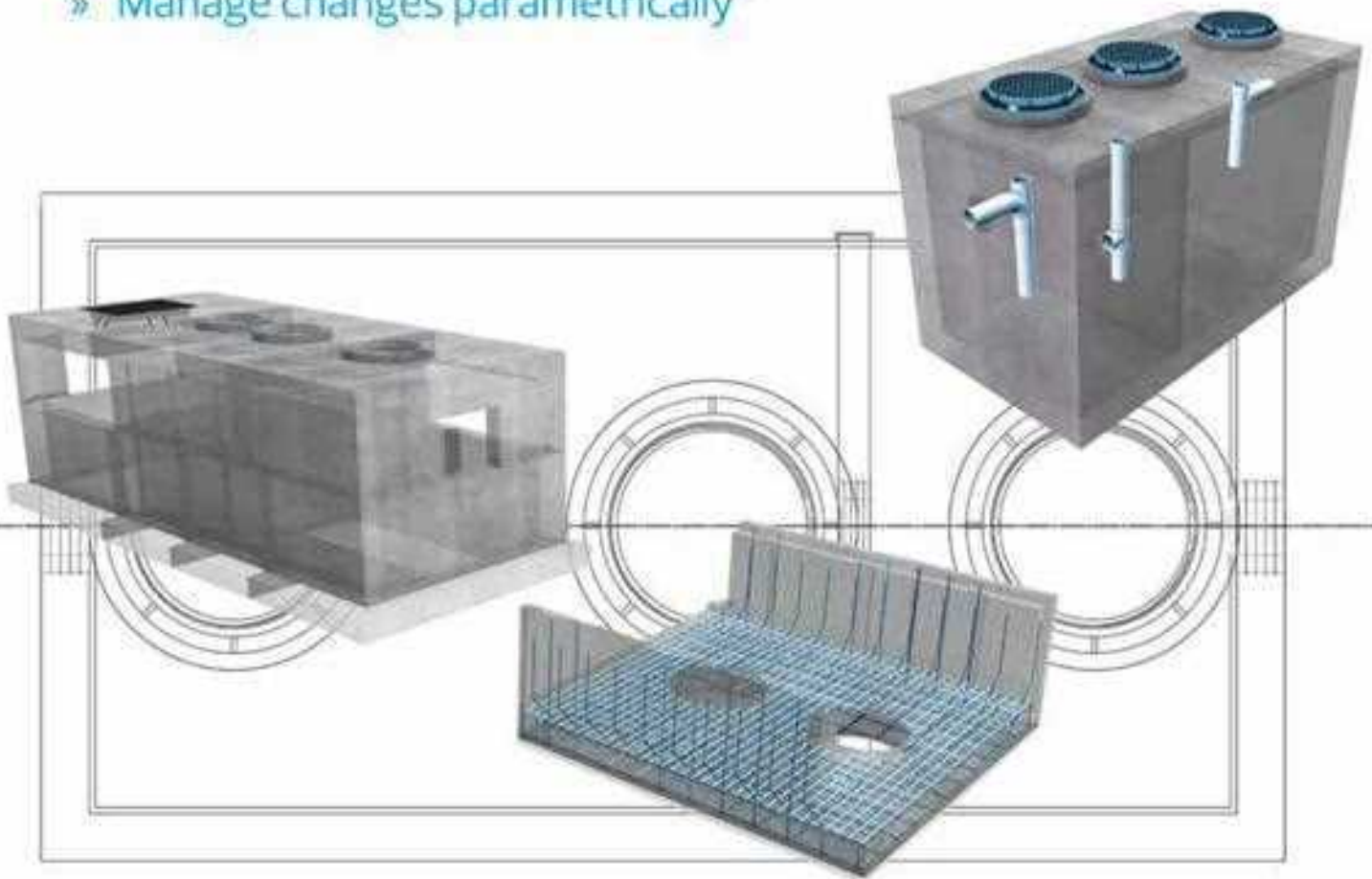
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helped the project earn LEED credits.

Smith-Midland fabricated 70,000 square feet of acid-wash finished, high-strength, architectural precast concrete from March to August 2015. The 746 panels included 25 different configurations, with the largest piece weighing 18,600 pounds.

Another challenge was to make the forming process at the plant efficient. Grogan said it took some ingenuity, but Smith-Midland was able to minimize the formwork and maximize what the architect wanted to achieve with the building.

Workaround for lost time

Installation also proved difficult since some panels had to be installed under slabs that were already in place.

“From a design perspective, this job was very complex,” Grogan said.

In addition, access was an issue in this heavily traveled urban environment. A staging yard near the job site was used to stockpile several loads for emergency use when weather conditions prevented trucks from delivering.

High winds interrupted the installation initially, forcing Smith-Midland to use two tower cranes simultaneously to get back on schedule. Workers set



The high-thermal mass precast concrete wall panels absorb heat during the day, and then slowly release heat as temperatures drop at night.

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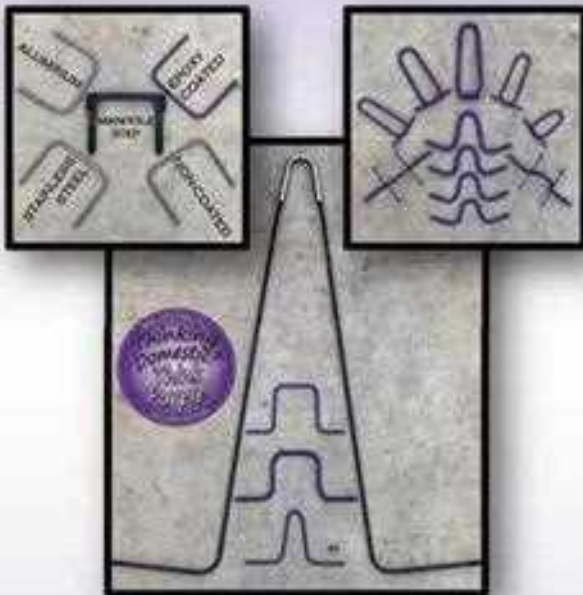
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Flooding caused a large portion of Ellicott Mills roadway to wash away after an aluminum culvert installed beneath it failed.

a precast panel with the first crane, then repeated the process with the second crane. The strategy worked.

Sustainability: A win for everyone

“Everybody worked together to achieve LEED Gold,” Grogan said. “This was definitely a design-assist job. Every job has challenges, but solutions are available as long as you spend the time to dissect them and come up with a solution as a team.”

Grogan believes sustainable building practices start in the precaster’s own plant. Precasters constantly need to look for improvements, whether it’s shaving off time, using less material or making a process more cost-effective. Then they need to promote those efficiencies and show customers how that will benefit them.

“It’s a win-win on the cost side when you are sustainable in your own plant,” Grogan said. “It does transfer into the building design and also into what the customer pays down the road, especially in back-end costs.”

RESILIENT BUILDING PRACTICES

One definition of resiliency is the ability to avoid damage, or to absorb or withstand major damage. With extreme weather producing catastrophic results in recent years, building for resiliency is becoming a necessity. In 2018 alone, insured losses due to natural disasters in the U.S. was \$52 billion.³

Communities now realize they must create resilient buildings and infrastructure if they are going to survive. Key attributes of resiliency include longevity, sustainability, durability, robustness and resistance



“The question was, do you put in another 10-foot-by-15-foot culvert or do you design for your ultimate need? And we designed for our ultimate need. A culvert of this magnitude is going to last the community much longer.”

– Greg Ouimette, *Oldcastle Infrastructure*

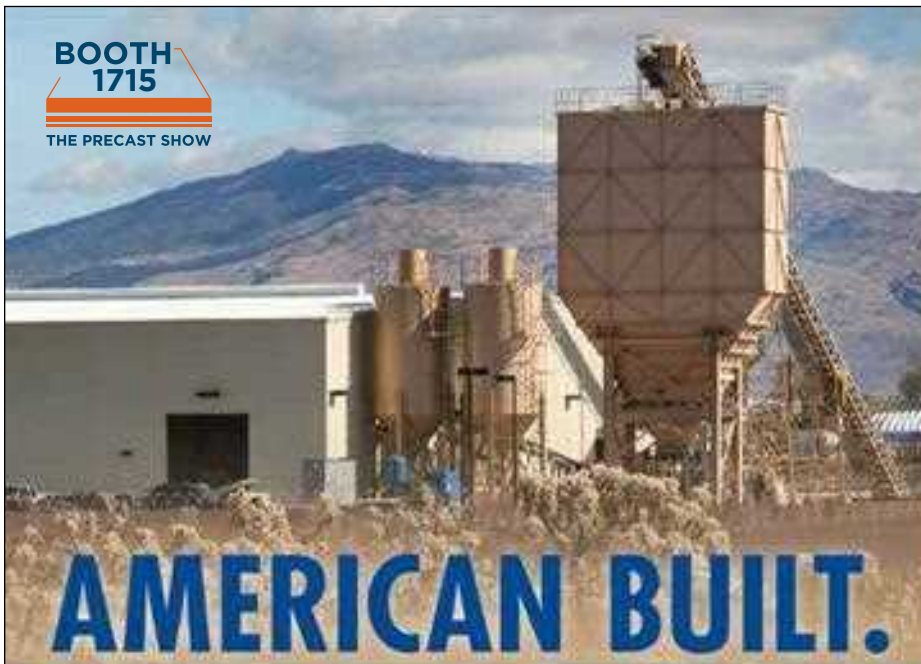
to disasters.⁴ When it comes to achieving resiliency, building or rebuilding with precast concrete fits the bill.

“Ellicott City is the perfect example of this,” said Greg Ouimette, business development manager for the North Region for Atlanta, Ga.-based Oldcastle Infrastructure.

Historic Ellicott City, Md., is located in Howard County near the area where four river branches converge to join the Patapsco River. In 2016, a 1,000-year flood hit the city with devastating results. The city had barely recovered when torrential rainfall in May 2018 produced a second 1,000-year flood. This time, a 50-year-old, 400-foot-by-15-foot-by-10-foot corrugated aluminum culvert near the intersection of Ellicott Mills Drive and Main Street failed. As a result, a large section of Ellicott Mills Drive, the city’s main emergency route out of town, washed away.

“We had an inspection regimen, but it’s very difficult to see inside the pipe to assess its condition,” said John Seefried, P.E., deputy chief, bureau of engineering for the Howard County Department of Public Works. “We weren’t aware of any defects because they were hidden under a foot or so of sediment and the constant flow of the stream.”

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Photo provided by Oldcastle Infrastructure

Decision time

The first decision the city made was choosing what material should be used for the replacement culvert. Corrugated metal and aluminum were considered but rejected in favor of reinforced precast concrete. Precast concrete doesn't corrode, and it has a potential life cycle of 100-plus years. The forward-thinking city also planned for the future by replacing the old culvert with a culvert large enough to survive the ravages of another 1,000-year flood.

"The question was, do you put in another 10-foot-by-15-foot culvert or do you design for your ultimate need?" Seefried said. "And we designed for our ultimate need. A culvert of this magnitude is going to last the community much longer."

Meeting a tight schedule

Oldcastle Infrastructure engineered a 130-foot-by-24-foot-by-13-foot, clamshell-style box culvert for Ellicott City. The walls measure 1 foot thick and the top and bottom slabs, 1 foot 10-inches. It took 57 pieces, each weighing 23 tons, to produce the oversized culvert.

The biggest challenge during the fabrication process was the tight schedule. Oldcastle Infrastructure had to produce the material in only six weeks. That meant devoting more resources to the project and holding suppliers of the special-order, epoxy-coated steel to a deadline.

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– Greg Ouimette, *Oldcastle Infrastructure*

The design for the high-strength concrete mix called for 5,000 psi, but Oldcastle Infrastructure overdesigned the mix, so 28-day breaks were well above the required compressive strength.

“That made it stronger, and it set up a lot faster,” Ouimette said. “We could move the pieces with less chance of them breaking or chipping. We were really looking for a fail-safe product, and we got it.”

Going underground

Oldcastle Infrastructure actually beat the six-week deadline and began delivering the pieces one at a time to the job site. Worcester, Pa.-based general contractor Allan Myers installed the precast clamshell culvert. Limited access was the only hitch in the installation process. To place the pieces at the correct depth from a distance, a larger crane was procured. Once the pieces were in place, it was just a matter of tightening the cast-in bolts to pull the top and bottom pieces together.

One issue with installing a significantly larger culvert is the increased flow would cause flooding downstream. That was remedied by adding restrictive walls at the



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Photo provided by Oldcastle Infrastructure

The new precast concrete culvert installed at Ellicott Mills Drive weighs 23 tons and is 140 feet long, 24 feet wide and 13 feet high.

front of the culvert to control flow volume. For now, the structures immediately downstream receive the hydraulic equivalent of the output of the older culvert. Future plans call for replacing those structures with tunnels that can accept the capacity of the new culvert. When that happens, the walls will be removed.

A job well done

Ellicott Mills Drive was back in service in April 2019, and the area downstream of the culvert was opened shortly after Labor Day.

“It all went down flawlessly,” Ouimette said. “I’ve been in this industry for 31 years, and I’ve never seen two companies, meaning Oldcastle Infrastructure and Allan Myers, work closer together. It was a really great project.”

For Seefried, the bottom line was this, “We built it stronger and better than it was.” **PI**

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

RESOURCES:

- 1 <https://www.usgbc.org/articles/world-green-building-trends-2018-green-keeps-growing>
- 2 <https://www.usgbc.org/articles/us-green-building-council-report-reveals-19-growth-lead-residential-market>
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- 4 precast.org/2013/01/resiliency-stand-up-to-natural-distasters-with-precast-concrete

REFERENCES:

- i <https://precast.org/2012/11/green-piece-heat-islands-are-no-tropical-paradise>
- ii <https://precast.org/2012/12/thermal-mass-2>





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Working For You

Precast Days 2019:

A National Initiative Makes Local Connections

NPCA supported a national initiative this fall to connect members with their local communities. The inaugural Precast Days event offered an opportunity for members to engage with specifiers, regulators, construction professionals and academia in a unique way. More than **30 participating plants** offered tours and explained and demonstrated equipment, technology and engineering production best practices that are used to make precast concrete products.



Precast Days 2019 provided a few fundamental objectives for each participating plant to execute their own unique version of the event:

- ▶ Shine a light on precast as a construction material of choice;
- ▶ Showcase the plant's products, company values and brand; and
- ▶ Build business by making relationships.

NPCA kicked off Precast Days 2019 by implementing a national marketing strategy focused on creating broad awareness. NPCA also handled high-level logistics, which included developing a webpage for attendee registration, managing the registration process, providing resources and handout materials for plants, coordinating opportunities for plants to exchange ideas and suggestions, and more. Each individual plant then handled the local

Provided by Shear Concrete Products

level marketing and coordination, including setting daily agendas and targeting specific audiences.

Precast Days plant accounts

Lindsay Precast's plant in Canal Fulton, Ohio, welcomed 120 engineers; contractors; and municipality, county and state professionals during its Precast Days event. The open house event was marketed as, "Opportunities for Precast in Your Industry," which allowed attendees to see each precast product line and learn how it fit their needs. General Manager Dean Wolosiansky said the plant also held an employee event, "What is Precast All About," as part of Precast Days. Employees' families were invited to visit to see the work their family member does.

Shea Concrete Products opened its four manufacturing facilities for the public to see how its employees manufacture high-quality precast concrete products. Each plant held an open house, technical engineering seminars and plant tours. According to Hugh Scott, P.E., allowing visitors to see how precast products are made in-person and have questions answered on the production floor offers a great learning experience and new perspective on how precast concrete offers value to the construction industry.

Wieser Concrete Products had three plants participate in Precast Days events. Each plant offered an optional one-hour presentation about the advantages of precast concrete and had staff available for questions and answers during touring sessions. Students who attended the tours were also invited to apply for internships to work with the company.



Provided by Lindsay Precast



Provided by Shea Concrete Products



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Thank you to all the plants that participated in Precast Days 2019 – your commitment to education and outreach within your communities contributed to a successful event.



To learn more about NPCA's inaugural Precast Days, visit precast.org/precastdays

NPCA Plant Certification Changes for 2020

The NPCA Quality Control Manual for Precast Concrete Plants serves as the guidance document for the association's plant certification program. As a management tool and technical resource for quality production and manufacturing practices, the manual is under continuous scrutiny to ensure it remains current with advances in technology.

Each year, the NPCA Quality Control/Quality Assurance Committee reviews the content of the NPCA QC Manual with the goal of increasing clarity and making needed improvements. For the 2020 version of the 14th Edition of the manual, the committee made one significant and a few minor changes that members and specifiers are asked to review during a 60-day comment period. The 60-day comment period for the 14th Edition of the NPCA QC Manual opened Nov. 1, 2019 and ends Dec. 31, 2019.

THE QA COMMITTEE VOTED AND APPROVED THE FOLLOWING SECTION CHANGES TO THE QC MANUAL:

- **Section 1.1.2.10** – clarified language
- **Section 1.1.4 Continuous Improvement** – added commentary language to the section
- **Section 2.3.5 Fiber Reinforcement** – removed commentary language
- **Section 2.3.6 Joint Sealants and Connectors** – moved commentary language to Standard
- **Section 4.5.3 Curing with Heat and Moisture** – rewritten to change frequency of initial set testing to quarterly
- **Section 6.2.1.2 Stormwater Concrete Pipe – Three-Edge Bearing Testing (Critical Requirement)** – added language, "If allowed by project specifications or authority having jurisdiction, compressive strength cylinder testing and companion rational design calculations may replace TEB testing."
- **Section 6.2.2.2 Sanitary Concrete Pipe – Three-Edge Bearing Testing (Critical Requirement)** – added language, "If allowed by project specifications or authority having jurisdiction, compressive strength cylinder testing and companion rational design calculations may replace TEB testing."
- **Plant Terms and Conditions** – removed language in Section 5.4.1
- **Plant Terms and Conditions** – added Section 8.4.2

These changes ensure the highest quality manufacturing processes from NPCA certified plants and provide assurance to customers regarding quality. NPCA certified plants are required to review their plant-specific manuals and processes annually and complete review of all critical sections that apply to the products manufactured.

For a complete copy of the addendum and the highlighted version of the proposed 2020 QC Manual that includes the sections mentioned above, visit precast.org/qcmanual. **PI**



The 60-day
comment period
for the 14th Edition
of the NPCA QC
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For a complete copy of the addendum and the highlighted version of the proposed 2020 QC Manual that includes the sections mentioned above, visit precast.org/qcmanual

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NPCA FOUNDATION WRAP-UP:

New Board Member; Scavenger Hunt Fundraiser

The NPCA Foundation held its annual fundraiser at the 54th Annual Convention in Seattle. This year, the Foundation hosted members and their families as they raced around the world-famous Pike Place Fish Market for a scavenger hunt. The event concluded at Pike's Brewery. The Foundation raised an estimated \$20,000 for its industry outreach efforts, internship program and scholarship funds.

In addition, the Foundation added Greg Stratis of Shea Concrete Products to its Board of Directors at the meeting.

To learn more about the NPCA Foundation and how it directly benefits the precast industry, visit precast.org/foundation. **PI**



Greg Stratis



To learn more about the NPCA Foundation and how it directly benefits the precast industry, visit precast.org/foundation.



The NPCA Foundation extends a special thanks to the sponsors of the 54th Annual Convention fundraiser:

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2019 ANNUAL CONVENTION:

National Precast Concrete Association Elects Leaders, Honors Influencers



NPCA members elected Jonathan Ohmes, Champion Precast, as Chairman of the Board of Directors.



Darryl Cloud (left), the 2011 Robert E. Yoakum Award winner, presented the 2019 award to Don Jensen, CEO of Jensen Precast.



Kevin Camp (right), Camp Precast Concrete Products, receives the Douglas G. Hoskin Award from incoming NPCA Chairman Jon Ohmes, Champion Precast.

The National Precast Concrete Association (NPCA) held its 54th Annual Convention in Seattle, Wash., Oct. 3-5, during which it elected new board members and officers and honored industry leaders. Attendance topped 450, with more than 70 exhibitors.

NPCA members elected Jonathan Ohmes, CEO of Champion Precast in Troy, Mo., as Chairman of the Board of Directors for a one-year term. Rounding out the leadership are Chairman-elect Ron Sparks of Columbia Precast Products in Woodland, Wash., and Secretary/Treasurer Mark Wieser of Wieser Concrete Products in Portage, Wis.

In his acceptance speech, Ohmes spoke about his family's background in the industry and his history with NPCA, which started at the 1985 annual meeting, as well as his excitement for the future of the association.

"The best part about NPCA is while no two histories are alike, we are all now a part of the future of NPCA and the precast industry together," he said. "That is the beauty of this association and why I am so proud to be a member and your chairman for the next 12 months."

Also elected to the Board for three-year terms were Greg Barrett of SI Precast Concrete in Grandview, Mo., Kevin Camp of Camp Precast Concrete Products in Milton, Vt., James Pryor of Atlas Concrete Products in New Britain, Conn., and James Wright of CAM Products in Ludington, Mich.

Don Jensen, CEO of Jensen Precast, headquartered in Sparks, Nev., was presented with the prestigious Robert E. Yoakum Award for his long-time service to the industry and association. Kevin Camp, president of Camp Precast Products in Milton, Vt., was presented the Douglas G. Hoskin Award for membership recruitment.

Other highlights included a tour of two precast plants and the Boeing Future of Flight and Aviation Center, as well as the rollout of a new committee structure. The NPCA 55th Annual Convention will be held Oct. 15-17 at Amelia Island, Fla. **PI**



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National Precast Concrete Association Names Next President and CEO



Frederick H. Grubbe

The National Precast Concrete Association (NPCA) is pleased to announce that **Frederick H. Grubbe**, MBA, CAE, has been selected by its Board of Directors to lead the association as its President and Chief Executive Officer. Grubbe will start January 2, 2020, and succeeds Ty Gable, who will retire from NPCA at the end of the year after nearly 26 years.

In his role, Grubbe will lead NPCA's staff, programs and activities to ensure objectives are attained, plans fulfilled, and member needs are met. He will participate with the Board of Directors in developing the strategic plan and maintain effective internal and external relationships.

“Jon Ohmes [NPCA incoming chairman] and I feel Fred's experience and knowledge are an excellent fit,” said NPCA Chairman of the Board, Mike Hoffman. “The Search Team worked diligently to find an exceptional candidate and, along with the Executive Committee and Board of Directors, voted unanimously to hire Fred. We are excited for him to join the staff and begin the next chapter for NPCA.”

Grubbe brings more than 25 years of non-profit executive leadership experience in associations, foundations and government. He previously led the Appraisal Institute, National Fraternal Congress of America and

the Think First Foundation. He has also been active in the Association Forum of Chicagoland, having served as Chair of the Board. In addition to his nonprofit experience, Grubbe has held senior positions with the U.S. Department of Transportation and in the White House.

He holds a Bachelor of Arts from Northern Illinois University, an MBA from the Loyola University Chicago Quinlan School of Business and completed an advanced strategy certificate course at the University of Chicago Booth School of Business. He also is a Certified Association Executive (CAE), which is bestowed by the American Society of Association Executives (ASAE).

“It's an honor and a privilege to have this opportunity with NPCA,” Grubbe said. “As just the fourth President and CEO since the organization's founding in 1965, I have some big shoes to fill following Ty Gable. With our nation's leaders currently considering significant infrastructure investment in the next few years, the future for precast concrete products is very solid. I'm delighted to join with the organization's seasoned leadership and outstanding staff team in ensuring that precast concrete manufacturers and products are at the forefront of that historic investment in our country.”

The NPCA represents manufacturers of quality precast concrete products and suppliers to the industry. NPCA has members in all 50 states, eight Canadian provinces and 11 other countries. **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 sgeer@precast.org.



A-LOK Products and Seaman Corp. Announce Strategic Alliance

A-LOK Products and Seaman Corp. announced a strategic alliance to offer the precast concrete industry more solutions for concrete protection against corrosion. A-LOK Products will now offer the XR QuikLiner technology to its customers, which will also allow the company to refine its other liner products.



Natalie Martin



Tauna Prince

Cresset Welcomes New Technical Sales Managers

Cresset Chemical Company added two team members to fill new positions providing technical support to customers in the U.S. **Natalie**

Martin is the company's technical sales manager for the eastern U.S., and **Tauna Prince** is the technical sales manager covering the western U.S.

Martin and Prince will work with concrete producers and distributors throughout the region to provide technical support, conduct product demonstrations and provide recommendations on Cresset's line of construction chemicals.

Tindall Corp. Adds to HR Department

Tindall Corp. announced **Ellen Bassett** joined the human resources team as director of talent acquisition and organizational development. This executive-level addition will aid in furthering the company's recruitment and growth initiatives.

Bassett is responsible for managing organizational needs and design as well as facilitating professional development programs at all levels of the organization.



Ellen Bassett

Vacuworx Hires Regional Sales Manager

Vacuworx hired **Bruce Williamson** as southeast regional sales manager, serving the territory of Florida, Georgia, Alabama, North Carolina, South Carolina, Kentucky and Tennessee.

His responsibilities include maintaining a superior level of customer satisfaction in relation to the sale, rental and service of Vacuworx lifting systems for all lines of pipe handling and construction-related equipment.



Bruce Williamson

Taylor's New Focus on International Markets; Midwest Big Lift, Inc. Joins as Dealer

Taylor International and Taylor International de Mexico will now be a direct company under The Taylor Group of Companies. With this change, Taylor International will bring a new line of products to the world market and deliver a new emphasis on Taylor service, sales and support.

Taylor Machine Works also announced Midwest Big Lift, located in St. Louis, Mo., has joined the Taylor and Sudden Service dealer network. Midwest Big Lift is one of the largest Taylor equipment dealers in the Midwest providing Taylor lift truck sales and a rental fleet for material handling needs.

Water Treatment Solutions Welcomes Concrete Sales Director

Water Treatment Solutions, Inc. welcomes **Della McDonald** as director of sales for concrete. McDonald will be responsible for driving revenue focused within the concrete Industry. She will be responsible for sales, sales team development and leadership, product enhancements as well as general management responsibilities.



Della McDonald

Mixer Systems Celebrates 40 years

NPCA member Mixer Systems is celebrating 40 years in business. The company was established in 1979 when company founder William Boles purchased the Turbin & Tilter mixer lines from T.L. Smith Company. Mixer Systems is the largest maker of pan mixers in North America. Today, there are more than 3,000 Turbin Mixers in use worldwide. **PI**



William Boles

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CALENDAR OF EVENTS



March 5-7, 2020
THE PRECAST SHOW 2020
Fort Worth Convention Center
Fort Worth, Texas



Oct. 15-17, 2020
NPCA 55TH ANNUAL CONVENTION
Omni Amelia Island Resort
Amelia Island, Fla.



Feb. 25-27, 2021
THE PRECAST SHOW 2021
Ernest N. Morial Convention Center
New Orleans, La.



Oct. 28-30, 2021
NPCA 56TH ANNUAL CONVENTION
The Broadmoor Hotel
Colorado Springs, Colo.



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

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