

PLACEMENT AND FINISHING + FORMED SURFACE IMPERFECTIONS

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Charting Their Own Path: S&M Precast

24 Becky and Ray Graf started S&M Precast in a lean-to on their farm. By always thinking ahead, the company has grown exponentially since its humble beginnings.

On the Cover:
For Becky and Ray Graf, it's all about family. S&M Precast is named for two of their daughters – Stephanie and Mary. Pictured from left: Mary Graf, David Miller, Becky Graf, Stephanie Graf, Ray Graf, Matt McNicholas and Krystal Graf.

Photo by Matt Werner

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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.

Jim writes:

Is a vacuum test required for all manholes? What is the frequency requirement?

NPCA Technical Services engineers

answered: Frequency is dependent upon a few factors. If the vacuum testing occurs at the precast producer's plant as part of its quality control/quality assurance program, the frequency of testing for manhole products used in sanitary sewer applications or other installations where installed measurable infiltration/exfiltration requirements exist would be established in the plant's QC manual. There are no specific code requirements stating what that frequency shall be.

Similarly, per ASTM C1244, "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill," installed manhole structures do not have a testing frequency specified within the standard. Rather, the testing frequency is required to be stated in the project specification. Additionally, many states have included this testing in their specific sanitary sewer regulations along with the testing frequency expectation. These state regulations also permit the approval testing per an infiltration/exfiltration type of hydrostatic test, but many prefer the ease that a vacuum test provides versus the hydrostatic tests.

The NPCA article, "Vacuum Testing Precast Concrete Manholes," was published in 2010. Since that time, the issue regarding whether it is preferred to test installed manholes before or after backfilling has still



not been resolved. An ASTM Committee C13 task group is currently developing a specific installed and backfilled manhole vacuum test standard, but it has not yet been approved. If there is high groundwater on the outside of the installed manhole to be vacuum tested, analysis and care needs to be taken to ensure the combination of internal vacuum and external hydrostatic pressure does not exceed the recommended maximum forces on the resilient rubber pipe/manhole connector, which could lead to unintended leakage.

John writes:

What is the effect of the variability of loading rate on the strength of a concrete cylinder? The majority of concrete compressive strength testing machines used in the industry are termed semi-automatic, but loading is in fact controlled manually by the operator, which relies on the operator's ability to maintain a consistent load application rate. Would an automatic loading control improve the consistency of concrete cylinder strength test results?

NPCA Technical Services engineers
answered: As you know, a semi-automatic compressive strength testing machine relies on a hand-operated valve or lever to regulate the load rate on a cylinder. You mentioned

the operator's ability to keep the correct pace until failure, so let's address that statement first. The intent in applying the load is to do so continuously and not intermittently to avoid shock. Section 7.5 of ASTM C39, "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens," states the load rate should correspond to a stress rate on the specimen of 35 +/- 7 psi per second. Therefore, there is a tolerance of 14 psi during the application, and as long as the operator stays within that tolerance, their pace is acceptable.

Next, let's address your question about how an automatic system would affect repeatability and consistency and, consequently, variability of test results. When we rely on manual adjustments during any testing procedure, there will inherently be some variability. In the case of operating a semi-automatic compression machine, each user will apply and adjust load rates differently and the associated variance will depend on the machine, the aptitude of the user, and the number of users in that plant. There's no way to eliminate variability of application in this case, but there are measures that can be taken to minimize it. Multiple users should work together on how they will operate the machine and they need to be as consistent as possible in how they apply and adjust loading rates.

An automatic compression machine applies the load rate as required and does not involve manual adjustments of valves or levers. Using this apparatus removes the variability inherent with hand-operated load rates. There will still be variability based on the machine and its recommended and appropriate calibration. However, the automation improves consistency and reduces variability compared to a hand-operated system. **PI**

ONE THING

PLACEMENT & FINISHING

By Kayla Hanson

Editor's Note:

This is the fourth article in a year-long series that focuses on the details and more technical aspects of one common thing precast concrete producers do on a daily basis.

Imagine you're restoring a classic car. You spent years carefully taking each component apart and tirelessly searching for authentic parts. You applied advice from countless hours of research, used tips from others who were embarking on similar projects and learned lessons from other gurus to create something you're truly proud of. Although each part you selected is crucial to the overall finished product and its performance, all the time, effort and money spent on the project would be diminished unless you used the proper techniques, careful placement of each part and the right tool for each job from start to finish.

In any industry or job where end-product quality is key, every step of the production process requires significant attention to detail. This is true for classic car restoration, and especially true for precast concrete. During placement and finishing, excessive free-fall heights, improper chute angles or troweling too soon can all impact fresh and hardened concrete quality. ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," outlines best practices to help maintain fresh concrete quality and consistency from the mixer to the finished product.

PLACEMENT

The homogeneity and consistency of fresh concrete must be maintained during its travels from the mixer, down the chute, into the transport bucket and around the plant. This includes travel into the formwork and around the reinforcement and embedded items during consolidation. Other characteristics like w/c, slump or slump flow, air content, temperature and unit weight must also be preserved throughout these steps.

Handle fresh concrete as little as possible

With so many steps involved in the placement process, it's easy to see how each one could potentially threaten the concrete's quality and consistency. Best practices must be followed. Fresh concrete should be handled as minimally as possible and transferred from one receptacle to another as few times as possible. Reducing the amount of handling can help maintain fresh concrete's characteristics and lessen the likelihood of segregation.

Strategically placing forms near the mixing equipment is a good idea. Reducing the duration and distance the concrete bucket travels around the plant can also help preserve the homogeneity of the mix.

Find the right chute angle

Fresh concrete should flow freely and steadily out of the mixer and down the chute into the receptacle or bucket used to transport concrete around the plant. Adjust the chute's angle to improve the concrete flow into the bucket.

Use transport bucket best practices

Do not apply form release agent inside the transport bucket to aid concrete discharge or to expedite cleaning later. Form oil in the bucket or on the chute into the fresh concrete and affect its performance.

Using bottom-dump buckets enables placement of concrete at the lowest practical slump while still allowing proper and sufficient consolidation. The

bucket's side slopes should be at least 60 degrees from the horizontal, and the walls of the bucket should be smooth and well-maintained so the bucket is free of concrete upon emptying. Be sure to clean the bucket thoroughly at the end of each shift.

Position the concrete transport bucket below the chute so the concrete is deposited into the bucket directly over the bucket's gate opening. The bucket should be filled from the center and the concrete depth in the bucket should rise consistently. Concrete should not be deposited into the bucket off-center from the gate opening by flowing down the sides of the bucket or by hitting a wall of the bucket.

Concrete flow should start as soon as the discharge gate is opened. During discharge, ensure the gate opening is at least five times the maximum aggregate size in the mix being poured.

Deposit concrete as near to its final location as possible

Discharging concrete while the bucket is moving can cause concrete segregation. Concrete free-fall heights – whether from the mixer chute to the transport bucket or from the bucket to the form – should be limited to 6-8 feet; however, a shorter drop height is preferred.

If greater drop heights are required due to the formwork or conditions in the plant, use a tube, tremie or chute attachment on the bucket to guide the concrete on a slope from the bucket to its final location in the form. Ensure the tube attachment is not bent or kinked, as coarse aggregate can get caught and separate from the rest of the mix.

Control the flow

With any form – but particularly those with curved faces, sloped sections and narrow walls – allow concrete to steadily fill the forms in a controlled manner. Open the bucket gates carefully to avoid excessive initial flow rates which can cause splashing and aggregate segregation from paste.

Fresh concrete should not be allowed to deflect off one form face to the other as it makes its way through the form or to the bottom of the form. There is an increased likelihood for segregation when flows of fresh concrete are redirected, disrupted by reinforcement or ricochet off form walls. Self-consolidating concrete should be deposited behind the leading edge of its flow, allowing it to freely spread and fill the

Self-consolidating concrete will generally transport itself through the form and requires one point of placement.





NPCA file photo

- ▶ **Resin trowels** are usually made of canvas laminated in resin. They tend to provide a slightly rough finished texture, although smoother than wooden trowels. Resin trowels are more durable than wooden trowels.
- ▶ **Stainless steel trowels** are typically recommended when using white cement or colored concrete, as they are unlikely to discolor the concrete.
- ▶ **Standard steel trowels** are strong, rigid and long-lasting. However, proper care is needed to prevent them from rusting.
- ▶ **Blue steel trowels** usually have a thinner blade than standard steel trowels, making them more flexible and ideal for unique jobs like manhole inverts.
- ▶ **Magnesium trowels** are strong and lightweight. They tend to offer the most consistent blade profile due to their manufacturing process, which helps achieve a level surface with greater ease. Magnesium trowels glide across the concrete surface easier as well, helping create a smoother finish with fewer passes.
- ▶ **Aluminum trowels** are more rigid and heavier than magnesium trowels, yet still provide smooth, consistent finishes.

Avoid overworking the concrete

Overworking or overmanipulating concrete during finishing can draw fines and water to the unformed concrete surface and can cause coarse aggregates to be pushed deeper below the surface. This can result in the concrete surface having a higher w/c than the rest of the product and could lead to drastically decreased strength and durability and increased permeability. Some signs to watch for after the concrete



NPCA file photo

Floats are often used to level, fill voids and smooth the surface in preparation for troweling.

form. Converging flows should be avoided as this can entrap air between the two flows.

Avoid moving concrete laterally

Moving conventional wet-cast concrete laterally and scraping it off or across surfaces can result in segregation. Pay careful attention to the positioning of the concrete bucket over the form during

placement and discharge the concrete strategically to fill the form completely while preventing the need to scoop excess concrete from one area to deposit in another area. To avoid introducing contaminants into the mix, do not scoop spilled concrete into forms or back into the bucket.

Plan ahead

A plant's equipment selection should be appropriate for its intended use and based on its ability to efficiently and effectively complete the task at hand. Ensure the forms have received and passed their pre-pour inspections prior to batching to avoid unnecessary delays in placing the concrete.

FINISHING

Fresh concrete should have the lowest practical slump while still allowing for proper and sufficient consolidation. Finishing practices should be performed such that the fresh concrete is worked and manipulated as little as possible to achieve the desired result.

Select the right tool for the job

Precasters may first use a float on the unformed concrete surface to fill low spots and smooth out high spots. After floating, the concrete surfaces should then be troweled to achieve the desired finish. Troweling densifies and seals the concrete surface, which emphasizes the need for troweling to take place only after the majority of the bleed water has evaporated.

Floating surfaces prior to troweling is not necessary and does require additional time; however it can make the troweling process faster and easier. Floats are like coarse, lower-grit sandpaper while trowels could be compared to higher-grit sandpaper used for final finishing touches.

- ▶ **Wood trowels** are usually the most economical option up-front. However, the absorptive nature of wood means they can absorb mix water, warp and must be replaced frequently. They also tend to drag the concrete, rather than glide over it, resulting in rougher finishes.

has cured are dusting or delamination, both of which point to an excessive w/c at the concrete surface. Proper care when finishing is especially critical to ensure the concrete at unformed surfaces remains consistent with the entire cast product. This is particularly important for unformed surfaces that will be exposed to aggressive environments, such as wastewater structures or paving slabs.

Timing is important, but can vary

ACI 304 recommends delaying each step in the finishing process as long as practical while still enabling the concrete to achieve the desired results. Although it may seem counterintuitive to wait to trowel concrete until it's just begun to set, this can help improve the quality and durability of the final product. If an unformed concrete surface requires multiple steps in its finishing process (perhaps an initial troweled finish followed by a grooved or textured finish), allowing the concrete to achieve a certain level of stiffness prior to finishing can help prevent the coarse aggregates or other denser materials from settling, and causing excessive water to rise to the product surface.

However, waiting too long can be just as problematic as not waiting long enough. Allowing the concrete surface to set before performing the initial trowel will disrupt the concrete, causing the trowel to drag sticky concrete across the product surface.

What about defining initial and final set times?

Since concrete setting is a gradual process, ASTM International states that any definition of setting time must remain arbitrary.

Additionally, even with minor variations in proportions from one mix to the next, each mix is defined by specific targets for fresh and hardened concrete characteristics. As a result, they can behave differently and require specific steps or precautions depending on the time of year.

Therefore, it's important to be alert and observant, and adapt production practices and finishing timing to the specific needs of each mix and the given conditions of the day. Defining a fixed initial set time for all mixes and always using that set time before allowing initial troweling can result in challenges

A trowel finish can provide a smooth, hard and dense surface.

for each mix, particularly if set time is not adjusted at different times of the year. A particular initial set time that is accurate in July may need to be extended in December. Using general set times as a gauge or starting point can help fine-tune a more accurate window of finishability, which must be defined through experience with the mix design.

Manage bleed water

Bleeding in fresh concrete refers to the process where free water in the mix is pushed upward to the surface due to the natural settlement of heavier solid particles such as cement and aggregates. Some bleeding is normal but excessive bleeding that pools on the surface instead of evaporating is excessive and can be problematic.

Under no circumstances should bleed water be mixed into the concrete. Bleed water which doesn't evaporate after an appropriate amount of time following placement should be manually removed prior to troweling. Mixing bleed water into the concrete will increase the w/c of the affected concrete and can decrease durability and strength while increasing permeability.

Is the fuzzy fiber texture OK?

When working with steel or synthetic fiber reinforcement, particularly larger macrofibers, the ends of some fibers may poke out of the unformed surfaces after finishing and remain slightly exposed after curing. This can give the appearance of a slightly rough or fuzzy texture to the concrete, but is unlikely to affect product performance.

To help prevent this rough texture, consider trowel finishing the surface as late as possible in the window of finishability. By that point, the fresh concrete will have stiffened to a point where the tips of the fibers are more likely to remain completely embedded after the pass of the trowel.

What about adding water to the concrete surface?

Water should never be added to the fresh, unformed concrete surface to help achieve a smoother finish or to speed up the finishing process. Adding water to fresh concrete surfaces to aid finishing will significantly increase the w/c of the concrete surface and reduce its quality, strength and durability.

BRING IT INTO THE PLANT

Classic car restoration is a multi-step process where care is taken at every step in order to arrive at a great finished product. Consistently achieving the end-product performance of concrete requires a high quality, well-proportioned mix design; proper batching and mixing procedures; careful transportation; attention to detail during placement; proper consolidation; and the right tools, timing and technique when finishing.

Take this opportunity to review placement and finishing best practices during your next toolbox talk and stress the importance of attention to detail in every step of the precast production process. **PI**

Kayla Hanson is NPCA's director of technical services.



To learn more about proper concrete placement and finishing best practices, watch the NPCA Precast Learning Lab video, "Placing and Finishing," at precast.org/learning-lab

**EVALUATING
AND DIAGNOSING**

Formed Surface Imperfections

By Eric Carleton, P.E.

Surface Finishes

FORMED SURFACE CLASSIFICATIONS & SPECIFICATIONS

In 1975, the International Council for Building Research established a general classification of formed surfaces which is referenced in the most recent edition of ACI 309.2R, "Identification and Control of Visible Effects of Consolidation on Formed Concrete Surfaces." Those classifications are:

ROUGH – no special requirements for finishing

ORDINARY – surface finishing has a minor factor

ELABORATE – definite requirements for visual appearance

SPECIAL – highest standards for appearance [considered architectural]

Within ACI 347R-14, "Guide to Formwork for Concrete," there is a similar class system to differentiate concrete surface evaluation based on application:

- **Class D** - minimum-quality requirement for surfaces where roughness is not objectionable, usually applied where surfaces will be permanently concealed.
- **Class C** - general standard for permanently exposed surfaces where other finishes are not specified.
- **Class B** - intended for coarse-textured, concrete-formed surfaces intended to receive plaster, stucco or wainscoting.
- **Class A** - suggested for surfaces prominently exposed to public view where appearance is of special importance.

Finally, ACI 301-16, "Specifications for Structural Concrete," provides more detailed information. Those specifications are:

5.3.3.3(a) Surface finish-1.0 (SF-1.0):

- a. No formwork facing material is specified
- b. Patch voids larger than 1-1/2 inchwide or 1/2 inch deep
- c. Remove projections larger than 1 inch
- d. Tie holes need not be patched
- e. Surface tolerance Class D as specified in ACI 117-10, "Specification for Tolerances for Concrete Construction and Materials and Commentary."
- f. Mockup not required

5.3.3.3(b) Surface finish-2.0 (SF-2.0):

- a. Patch voids larger than 3/4 inch wide or 1/2 inch deep
- b. Remove projections larger than 1/4 inch
- c. Patch tie holes
- d. Surface tolerance Class B as specified in ACI 117
- e. Unless otherwise specified, provide mockup of concrete surface appearance and texture

5.3.3.3(c) Surface finish-3.0 (SF-3.0):

- a. Patch voids larger than 3/4 inch wide or 1/2 inch deep
- b. Remove projections larger than 1/8 inch
- c. Patch tie holes
- d. Surface tolerance Class A as specified in ACI 117
- e. Provide mockup of concrete surface appearance and texture

5.3.3.5 Unspecified as-cast finishes – if a surface finish is not specified, provide the following finishes:

- a. SF-1.0 on concrete surfaces not exposed to view
- b. SF-2.0 on concrete surfaces exposed to view

Green Bay Packers Coach Vince Lombardi said, "Perfection is not attainable, but if we chase perfection, we can catch excellence." Precast manufacturers try to make perfect products, but like most things, attaining complete perfection is elusive if not impossible. While the goal is to attain perfection, precasters recognize the economic and production realities that some product irregularities will occur. The goal is to mitigate imperfections while still maintaining tolerances and meeting owners' expectations.

Formed surface irregularities include bugholes, cracking, fins, honeycombing, sand streaking, layering marks, cold jointing, surface roughness, efflorescence, staining and color continuity [mottling].

Whether these surface irregularities are an acceptable blemish, or an unacceptable defect requiring repair, it depends upon the severity of the issue and the owner's expectation of the surface finish for that product. With vertical building projects, particularly architectural components, expectations are typically defined and qualified within the project specifications.

Consequently, it is typical for architectural precast components to require mock-up sections for inspection and evaluation by the owner/architect prior to casting. Additionally, general on-site blemish inspection and acceptance criteria must be established as described within ACI 303R-12, "Guide to Cast-in-Place Architectural Concrete Practice." It states, "Architecturally acceptable concrete surfaces should be aesthetically compatible with minimal color and texture variations and surface defects when viewed at a distance of approximately 20 ft. (6 m) or more, as agreed upon by the architect, owner, and contractor, or as otherwise specified."

However, for many underground precast concrete products such as water and wastewater or utility products, expectations of acceptable surface irregularity are not clearly described within contract documents or project specifications. This can sometimes lead to confusion on product acceptability. Concrete guide and code language can assist in describing surface finish criteria for concrete product applications within their intended purpose.

The goal should be to consistently manufacture products with the highest possible level of quality. This should include implementing continuous improvement processes to eliminate surface irregularities that can occur on precast concrete surfaces.

For formed concrete surfaces, many problems can be narrowed down to three practices: consolidation or vibration, form set up and maintenance, and form oil/release agent application.

Bugholes

There is little consensus on what is an acceptable criterion for a surface containing bugholes. One document, AASHTO R73, "Standard Practice for Evaluation of Precast Concrete Drainage Products," evaluates bugholes for certain products and is used as a guide by some agencies. However, there is general consensus on the cause, which is the entrapment of small air and water pockets between the fresh concrete and form wall. Two factors are primarily responsible for the excessive presence of bugholes:

1. Poor or improper concrete consolidation. Double check your vibrator settings and consolidation procedures and ensure all of the concrete is within the zone of influence. Watch NPCA's Precast Learning Lab video, "Proper Consolidation," to revisit proper consolidation procedures.

2. Excessive application of form release oil or agent. Thick application beyond the manufacturer's recommendations can cause air and water to travel along the form wall during consolidation. Use the thinnest application that still provides the release function. Watch NPCA's Precast Learning Lab video, "Form Oil Application," to revisit form release application best practices.

Honeycombing

Honeycombing is described as an area where greater than half of the coarse aggregate surface area is exposed and is not surrounded by mortar. Honeycombing is also linked to poor consolidation practices. However, poor concrete placement procedures, incorrect mixture proportions, or congested rebar sections can contribute to the phenomenon. Besides causing a poor concrete aesthetic, honeycombing can also pose a service risk due to reduced concrete strength, structural function and possible durability concerns. It is important to identify honeycombing characteristics, a repair remedy when appropriate and guidelines for when a repair remedy is not appropriate. A 2016 AASHTO document (R73-16), "Standard Practice for Evaluation of Precast Concrete Drainage Products," provides guidance. It states, "Honeycomb or bleed out that extends to a depth greater than the size of the coarse aggregate and exposes reinforcing steel or causes concrete permeability beyond the project specification for leakage, which either occupies a single defect area greater than 4 percent or a cumulative area greater than 10 percent of the internal surface area of the product shall not be repairable."



Cracking

Shallow surface cracking typically does not appear readily along the formed surfaces of ordinary or SCC concrete. If this occurs in a precast product, it is typically on the unformed exposed surface of the product, which will be discussed in more detail in the next article.

Fins

Fins occur when fresh concrete squeezes out of ill-fitting form joints. Concrete fins can be small and thin and easily remedied, but thick fins may require special consideration for removal to ensure greater damage or spalling doesn't occur. Forms need to be modified to improve tolerances to eliminate fins. In some cases, concrete fins within the bell or spigot area can interfere with a good joint connection and fins can come off during truck transit.

Form Bleed

Concrete form bleed occurs with ill-fitting forms that have a gap at the pallet interface, jacket or core connections. This allows the concrete mix, primarily paste, to leak out. The result is an excess amount of cement slurry on the production floor and a bleed out section on the product. This area has an appearance similar to honeycombing in that it has exposed aggregate with missing cement paste. Typically, this occurs at the bottom of the form where the mix has been dropped through the form opening. Many form bleed areas, depending on the affected size and depth, will require some approved patching remedy. The long-term remedy is to seal the leaking areas prior to casting or correct the gap tolerance with maintenance on the problematic form parts.

Poor Form Fit

Forms must be checked for dimensional tolerance prior to initial use, annually thereafter and each time the form is prepared for casting. That means most precasters are measuring and recording the dimensions of a particular form daily – every time it's used. This may seem excessive if finning or form bleeding aren't occurring, however, even minor offsets in the stripped product dimensions could result in a finished product that is out of tolerance.

Sand streaking

A sand streak propagates with water along the form wall, removing the cement paste and small fine aggregate and leaving behind elongated veins of exposed aggregate without cementitious paste. According to ACI 309R-19, "harsh, wet mixes that are deficient in cement and contain poorly graded aggregates may cause sand streaking and other problems." Sand streaking can occur within attached form vibrators, which can create a pumping action that can draw air into the formwork at the joints and force a water stream upward.

Layering marks

Layering marks are a visual anomaly showing where one concrete pour was cast on another and two batches have combined. Typically, these marks will dissipate with a consistent deep vibration technique to better blend the two pours along the form wall. If there is no issue regarding the visual effect and an explanation is needed for interested parties that the imperfection is not a cold joint, a layering mark provides no ill effects to the precast concrete product.

Cold joint

Similar to a layering mark, a cold joint is where two separate concrete batches are poured to complete a casting for a concrete component. However, unlike a layering mark, the two concrete batches have not become homogeneous. Typically, there is some delay in casting the second lift of concrete atop the first. Consequently, the first section has had time to initiate its initial set. This can be very problematic for several reasons. A product with unanticipated cold joints is an indicator of poor production practices. Typically, precast concrete products showing cold joints are not suitable for the intended purpose and cannot be repaired without additional analysis, surface preparation and the owner's approval.

Staining

Staining on formed surfaces is attributed to improper application of form release oil. If new wood forms are being used, pretreatments on the wood surface can leave a concrete stain. If the stains look rusty and the steel forms have been taken out of storage prior to usage, check the interior for rust spots and determine if the form surfaces need to be re-seasoned with the appropriate agent. If the rust staining is intermittent along the formed surface, it's a best practice to check if the wire ties being used are being bent away from the formed surfaces and are not straight out near the end surfaces.

Color continuity

Concrete colorization is a unique specialty requiring intricacies beyond the scope of this article. However, one simple message provided within the technical literature regarding maintaining concrete color continuity is to use extra consistent production practices. The precaster must be very intentional to use the same mix design and not revising cement, aggregate, admixtures. Additionally, variations with precast product vibration, form stripping time and curing conditions can lead to reduced uniform color conditions on the concrete surface.

As described in ACI 309R-05, "The formed concrete finish should be observed when the form is stripped so that appropriate corrective measures can be expeditiously implemented." This observation should be made by plant management or QC personnel who can act quickly to correct the next concrete pour and repair the product before it is transported to the yard.

Using ACI criteria and other industry best practices, if no finished formed surface requirements are included within the precast product standards, proactive precast concrete manufacturers can evaluate and designate an appropriate surface standard for their various concrete products. This evaluation and acceptance criteria along with an allowable repair procedure and final acceptance procedure should be included within the plant's written quality systems manual. This can be shared with the design and inspection community to provide a more uniform and rational on-site evaluation for delivered precast concrete structures.


Regardless of the end use, a well-cast product, free of formed surface irregularities, provides an excellent representation of a quality operation. **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.

ATTENTION PRECASTERS

DO YOU USE ANY OF THE FOLLOWING?

- Welded Wire Fabric
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Maintaining Load Securement Across Your Fleet

SIX WAYS TO MAKE LOAD SECUREMENT EASIER FOR THE DRIVER.

by Mindi Zissman



“You can’t beat physics. Because of the **nature of the precast product**, if it moves on the trailer, it has the potential to be a **catastrophic loss.**”

– Steve Bojan, *HUB International*



Proper cargo securement is critical to prevent driver injury and to ensure the safety of the driving public and pedestrians.

NECA (i)photo

If a precast concrete product moves or falls off a flatbed, there are no positive outcomes. That’s why load securement is a central part of the delivery process.

“You can’t beat physics,” said Steve Bojan, vice president of fleet risk services at HUB International. “Because of the nature of the precast product, if it moves on the trailer, it has the potential to be a catastrophic loss. Beyond that, the cost of resetting the product on the trailer is huge – it’s going to take cranes and forklifts. You’re not just going to have some guys pushing it back into place.”

Precast concrete manufacturers typically do their own securement, with each driver responsible for securing independent loads. On occasion, though, the company may contract its product delivery to a transportation specialist. When doing so, Bojan

recommends checking the company’s references to ensure the business is reputable and experienced with large, heavy loads.

The following risk management tips are critical to ensuring successful truck load securement across any precast concrete delivery fleet:

- 1. MAKE SECUREMENT EASY FOR DRIVERS.** Have straps permanently attached to trucks and trailers so drivers don’t have to look for cargo securement equipment. Have 4-inch straps, chains and binders already on each truck that can be configured based on the type and size of each load. Remember to inspect flatbeds, chains and straps routinely to ensure they are in good working condition.
- 2. PROTECT THE PRODUCT ON THE FLATBED.** While many flatbed decks have wooden inserts, steel- or aluminum-deck flatbeds should use some type of dunnage/buffer between the deck and product. This can minimize the chance of movement and potential damage to the precast concrete product. Before securing products to the vehicle, a rubber membrane or wooden boards should be placed between the deck and precast product. Similarly, when using chains and straps, don’t forget edge protection for the product so the likelihood of corner damage is minimized.
- 3. FEDERAL MOTOR CARRIER SAFETY ADMINISTRATION SECUREMENT RULES REIGN SUPREME.** According to the FMCSA Driver’s Handbook on Cargo Securement, a securement system must withstand a minimum amount of force in each direction. The securement system must withstand a minimum of 50% of the cargo weight in the rearward and sideways directions, 80% of the cargo weight in the forward direction and 20% of the cargo weight upwards. For example, a 10,000-pound load would need a securement system that would resist at least 5,000 pounds rearward and sideways, 80,000 pounds forward and 2,000 pounds upward.¹
- 4. LABEL AND TAG CARGO SECUREMENT LIMITS.** A driver should be aware of the weight of the cargo to determine how many straps are needed for proper securement. For example, if a strap has a 10,000-pound limit, and the product only weighs 6,000 pounds, only one strap is needed. However, products more than 5 feet in length need two tiedowns and one additional tiedown for each additional 10 feet of length. There are exceptions to these requirements when it comes to precast concrete, so transporters should always consult the applicable requirements. Because of the unique nature of trucking concrete pipe, the FMCSA has published special provisions exclusive to reinforced concrete pipe that can be found in the CFR 49 Chapter 3, Part 393.124.²
- 5. CREATE A SYSTEM OF CHECKS AND BALANCES.** Truck drivers should be instructed to contact dispatch when they need help securing products. Include cargo securement topics in regular driver’s meetings, and provide tips on how to do it safely. Loads must be inspected for proper securement and the inspection documented prior to leaving the plant premises.
- 6. CONSIDER LOCAL AND STATE REGULATIONS GOVERNING OVERSIZED AND OVERWEIGHT TRAVEL.** If a load is oversized – typically over 8 feet, 6 inches in width – states may require the use of additional equipment during transport like temporary flashing lights, flags or banners on the front and rear of the truck indicating a wide, overweight or oversize load. Depending on the local jurisdiction, road permits for overweight and oversized loads or an escort could be required.

“It has to be done **right the first time**. You’re not going to have another chance to do it right.”

– Steve Bojan, *HUB International*

Many precast concrete products come in odd shapes and sizes. All products are heavy and must be transported with care. They could be oversized or overweight, which can make load securement increasingly difficult.

Doing it correctly and safely each time requires attention to detail, the appropriate equipment for the job and a continuous focus on safety.

“It has to be done right the first time,” said Bojan. “You’re not going to have another chance to do it right.” **PI**

Mindi Zissman is a Chicago-based freelance writer who has covered the AEC industry, commercial liability and health care for more than 15 years.

REFERENCES:

1. https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/Drivers_Handbook_Cargo_Securement.pdf
2. <https://www.fmcsa.dot.gov/regulations/cargo-securement/drivers-handbook-cargo-securement-chapter-7-concrete-pipe-loaded>



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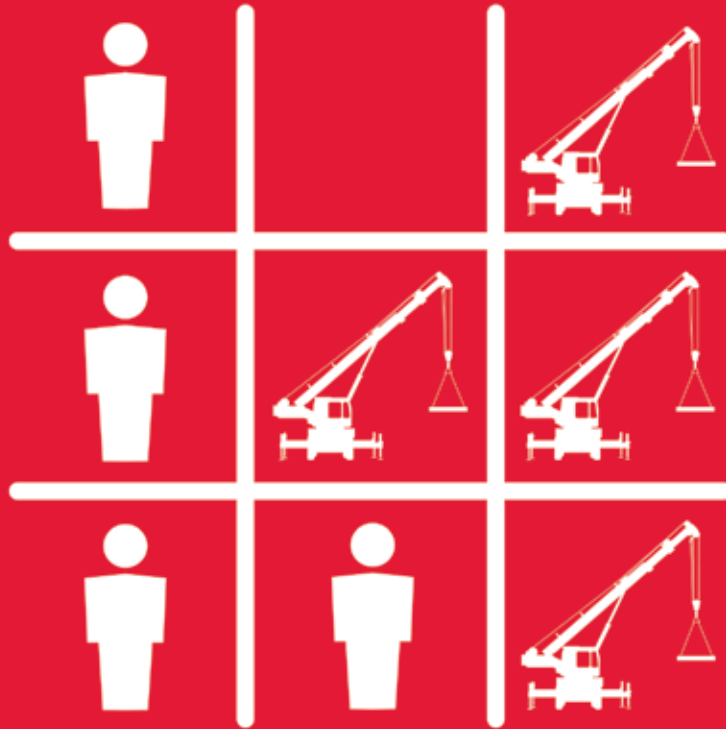
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In 2018, NPCA's outreach reached:

- 2,500 specifiers
- 500 students

with precast-specific content

FINDING LOCAL TALENT

By Alex Morales, M. Ed.

Now is the time for business owners to become actively involved in **workforce development** efforts.

The plant-floor labor pool is the backbone of the precast workforce. But long gone are the days when manufacturing drove the U.S.

economy and labor was plentiful. The convergence of technological, generational and economic shifts has resulted in challenges for precast manufacturers across the country. Young generations entering the workforce are influenced by high-tech, mobile careers. Precast human resource managers and executives agree that finding skilled labor gets harder with each passing year, and all the data points to the trend continuing.

While national efforts to address workforce issues abound, these efforts are less fruitful if local organizations and individual plants are not actively engaging in the process. But how does a single plant take advantage of myriad national workforce efforts to ensure it has the right talent on the production floor, the right quality personnel conducting plant quality inspections and the right tradesmen and women practicing their craft on the production floor? It takes an HR commitment to grow beyond simply posting job advertisements and waiting to see who applies.

HR INVENTORY

At a minimum, local companies should inventory their current HR initiatives and compare them to the recommendations from national organizations that have studied the workforce issue and published their findings. Those findings agree there will be more manufacturing jobs than job applicants. One prediction puts that shortfall in the 2-3 million range by 2025. That doesn't give individual precasters a lot of time.

In our recent workforce development series, we compared various points of research and showcased what some precasters are doing to make themselves more attractive to the local workforce than competing manufacturers. However, while researching for that series, we also discovered many precasters that simply rely on national efforts to attract the workforce without making any internal adjustments to their HR practices. That creates a disconnect between your plant and the potential employees the industry reaches.

NATIONAL OUTREACH EFFORTS

NPCA's outreach effort represents a multi-pronged approach to ensure the continued

success of the precast industry. The most visible efforts, such as specifier webinars and getting precast concrete options into specifications, may lead you to believe outreach is solely about increasing the market share of precast concrete. However, there's also a push to introduce precast concrete careers to the available talent pool that will be integral to precast businesses in the future.

Over the past year, NPCA has given presentations to university engineering classrooms to incorporate precast concrete into the curricula, participated in construction management associations to showcase precast concrete manufacturing as a viable construction-related management career and exhibited at career fairs that represent a variety of trades. We present about once per month to university classrooms around the country and more outreach opportunities are expected for the 2019-2020 academic year. NPCA's success in this arena, and the receptiveness of the students, shows there is a hunger to learn about other career options for students.

LOCAL WORKFORCE EFFORTS

A national presence alone, while important to help keep precast top-of-mind as a career option, cannot single-handedly ensure our contacts end up at your plant.

According to consulting firm Deloitte Insights, during the last decade of economic expansion, organizations have focused on finding the right talent to drive business growth. But with record-low unemployment rates and skills shortages in many technical areas, recruiting has gotten harder. Rather than automatically opening a job requisition when a manager needs a role filled, it's time to think about how organizations can continuously 'access talent' in varying ways.¹

What this means is individual plants must ramp up their commitment to workforce development by first revamping their traditional HR strategies.

WORKFORCE PLANNING

Many precasters likely already know what employee positions will be needed in the next year based on their current backlog. But, do you know what your individual plant's workforce needs will be in 2025? A long-term look at workforce needs may reveal a need to prepare a current employee for a larger or different role.

"First and foremost, organizations

should look much more strategically at moving current employees into available opportunities across the enterprise," said Deloitte Insights. "Reskilling an internal hire may take a year or so, but it can be done for as little as one-sixth the cost of hiring an external candidate."

This is an important exercise for precast plants, not just because it is fiscally advantageous but also because it clarifies what roles and positions you will be needing in the future. As you invest in current talent, you are actively involved in a retention activity, but also clearly defining the type of employee you need to hire next. Instead of being reactive to the ebbs and flows of the economy and the amount of work you obtain, you are proactively engaged in workforce planning.

CULTIVATING FUTURE TALENT

NPCA's outreach program has had success introducing students across the country to precast concrete. Throughout 2018 and into 2019, professional staff have been reaching out to local producers whenever they were in the area presenting to specifiers. Through the remainder of 2019 and beyond, the same will happen when we are in your local area presenting to colleges and universities so you can participate or just attend. Visit precast.org/working-for-you for data on the impact in this area.

Of particular importance is participating in local career fairs or recruiting events. HR representatives may not present technical information to a classroom, but can play a key role locally when universities or technical colleges invite NPCA professional staff to exhibit. Look out for a call later this year if we're in your area.

As the workforce development arm of NPCA's outreach efforts reaches more and more students interested in a potential precast career, local plants will play a pivotal role in showcasing specific jobs available to local employees. The plant that has conducted an internal workforce strategic plan will be able to successfully convert NPCA's national contacts to your plant's newest employee. **PI**

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

RESOURCES:

- https://www2.deloitte.com/content/dam/insights/us/articles/5136_HC-Trends-2019/DLHC-Trends-2019.pdf
- <https://operationalsolutions.nam.org/mi-skills-gap-study-18/>



Leadership NPCA offers a unique opportunity annually for individuals to sharpen their leadership skills and abilities by providing management training, industry association experience and networking opportunities.

DEVELOPING FUTURE LEADERS IN THE PRECAST INDUSTRY

With baby boomer leaders retiring in droves, precasters are realizing the need to develop the **next generation** of industry leadership.

By Bridget McCrea

When Aaron Ausen signed up for Leadership NPCA, he wasn't quite sure what to expect from the experience. The year-long program promised an opportunity to advance his career in the precast concrete industry, but what did that entail? And, what new skills and strengths would he take away from the experience?

Once the coursework and hands-on learning began, Ausen received

the answers to his questions... and more. One of the most valuable takeaways was something we all take for granted: the ability to truly listen to others. In today's busy, tech-centric world, that means being present, engaged and interested in what others have to say – and then taking those insights to heart.

“In the past, I struggled to really listen to people,” said Ausen, a business consultant and manufacturing expert at Rosetta Hardscapes

in Petoskey, Mich. “I was basically thinking about what I was going to say next instead of hearing what they were saying and engaging with them. That was my biggest issue.”

BEING PRESENT

The LNPCA instructors showed Ausen, who has/had years of experience running a precast plant under his belt, how to stop “thinking ahead” while having conversations, and to instead listen to the conversation taking place in front of him. He said the experience opened his eyes to the fact that leaders really need to listen, and it helped him improve in that area.

The educational experience also helped him see and understand his strengths and weaknesses as a leader, and gave him the tools he needed to fill in some of those gaps. He views leadership as a life journey, and said soft skills like empathy, good communication and integrity all help leaders succeed.

“The LNPCA program helped me understand what I struggled with and what I needed to do to succeed as a leader,” said Ausen, who today is using those skills and tools in his role as a consultant. “The instructor and the program itself works by really unlocking some deep-down thoughts and feelings that you may not have even known were there, and that’s a good thing.”

BUILDING EMOTIONAL INTELLIGENCE

In a tight labor market where national unemployment rates are hovering at historic lows (3.6% at press time), finding great leaders is a challenge. To help members, NPCA launched LNPCA in 2017. The program is based on the teachings of Jeff Patnaude of The Patnaude Group. It offers precast concrete professionals basic foundational tools for leadership and management in addition to inspirational and aspirational direction for self-development.

Instructor Mike Renquist of The Patnaude Group said as the labor market has tightened over the last two years, and the baby boomer generation continues to retire, identifying and developing new leaders has become more difficult.

“Right now, there just aren’t enough potential leaders in the precast industry or in any industry for that matter,” said Renquist.

Marti Harrell, NPCA’s vice president of technical services and professional development, said many LNPCA students come to the experience not really knowing what they’re going to learn or take away from it. By the time they graduate from the program, the lessons are crystal clear.

“We repeatedly hear from people who say it’s a life-changing experience, both professionally and personally,” said Harrell, who adds that the program forces them to take stock of how to merge their professional and personal lives. “Mike helps people understand the totality of leadership.”

IDENTIFYING AND CULTIVATING LEADERS

Randy Lindsay-Brisbin, vice president of Lindsay Precast, said his company has sent several employees through the LNPCA program. With a focus on leadership and management, the program has helped the organization identify, support and

cultivate several emerging leaders.

“That’s an ongoing challenge that we face as a company,” said Lindsay-Brisbin. “We saw the leadership program as a great opportunity to provide some of our key leaders – all of whom were identified by their general managers – with the chance to learn more about leadership.”

Lindsay-Brisbin said he was particularly interested in LNPCA’s focus on emotional intelligence, or being aware that emotions can drive behavior and impact people both positively and negatively. It’s also about learning how to manage those emotions – both the leader’s and the people he or she is working with – especially when that leader is under pressure.

“The LNPCA program helped me understand what I struggled with and what I needed to do to succeed as a leader.”

– Aaron Ausen, *Rosetta Hardscapes*

“To me, that means thinking about leadership in terms of knowing yourself, what makes you tick, what pushes your buttons and how you react when those buttons get pushed,” Lindsay-Brisbin explained. “From there, it’s about leading yourself first, and knowing what your values are, how you make decisions throughout the course of the day, and understanding what things you can and can’t control.”

With those foundational elements in place, Lindsay-Brisbin said future leaders can start thinking about how to lead others to greatness. This step-by-step process is invaluable in a world where many leaders and managers are put into positions by default, and without any formal training or support.

“There just aren’t many opportunities in our society for people to really get a good understanding of leadership in a thoughtful way, and in the presence of their peers,” said Lindsay-Brisbin. “That’s just one of the gaps that LNPCA helps to close.”

Individuals who go through Leadership NPCA gain knowledge of current industry issues, enhanced leadership skills, experience in networking and relationship building and more.



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KEY LEADERSHIP TRAITS

Leaders today face an interesting array of pressures and challenges that their counterparts probably weren't dealing with 10 or 15 years ago. Asked to do more with less while also grappling with a persistent labor shortage, leaders have to be able to balance their own capabilities with those of their workforces – and all while also keeping everyone happy, productive and in place.

“Aspiring leaders really need to have confidence in themselves, and that confidence has to extend to what they do and don't know,” Renquist said.

For example, let's say the company decides to start using a new manufacturing process or a new pouring technique. In this case, the leader has to ask questions and make sure he or she has the process down to a science before trying to teach it to others.

“They have to have confidence in what they don't know in order to have the courage to get out there and lead others down that path,” Renquist said.

“Aspiring leaders really need to have confidence in themselves, and that confidence has to extend to what they do and don't know.”

– Mike Renquist, *The Patnaude Group*

He sees the LNPCA as a good foundation for such thinking, namely because it shows students how to experiment with different communication tools, listening techniques and coaching methods.

The best leaders are also results-oriented, able to delegate and operate with high levels of honesty and integrity. At the end of the day, they're the ones who are tasked with delivering results, accomplishing big goals and knowing what it takes to get customers coming back for more. Strategically focused, the best leaders can also look at the big picture, break it down into digestible chunks and then convey it to their teams.

TEAMWORK DRIVES SUCCESS

According to Ausen, being a great leader also means being able to relate well to other people, and getting out on the floor is mandatory.

“In the precast industry, we tend to get tied to the numbers, and to hitting those numbers, to the point where we get tunnel vision,” he explained.

Instead, Ausen said leaders need to think about the business from a “team” perspective, and be involved with the group on a one-to-one level.

“Empathetic leaders who can put themselves in other people's shoes realize this, and understand that they're also part of the team,” said Ausen, who adds that today's leaders also need to “show up first and leave last.”

They also have to be ready to take most of the blame when things go wrong, and work to solve those problems.

“It's about being human and talking and interacting with others instead of just tracking numbers and submitting reports,” Ausen said.

Lindsay-Brisbin concurred, and said communication is a key leadership trait that isn't always easy to develop. He also sees integrity and consistency as two key signs that someone might be a good leader. Finally, he said the best leaders are both self-aware and introspective even when things aren't going their way. LNPCA helps to unlock these and other leadership qualities, allows students to identify their strengths and weaknesses, and helps them learn in an environment with other professionals who are dealing with the same struggles.

"To someone who wants to learn how to be a leader, LNPCA will help you understand whether you're cut out for it (or not)," Ausen said. "It will also help you unlock some traits you didn't even know were there, cultivate a constant state of learning and never settle for just being adequate." **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.

RESOURCES:

1 <https://www.ihhp.com/meaning-of-emotional-intelligence>



Applications to join the Leadership NPCA class of 2020 will be available August 15, 2019.
Apply at precast.org/leadershipnpca

The program is based on the teachings of Jeff Patnaude of The Patnaude Group, who is pictured here facilitating a discussion at a recent LNPCA session.



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CONSTRUCTING THE FUTURE



CHARTING THEIR OWN PATH: **S&M Precast**

By Matt Werner



NPCA file photo

Becky and Ray Graf started **S&M Precast** in a lean-to on their farm. By always thinking ahead, the company has grown exponentially since its humble beginnings.

S&M Precast sits along Interstate 65 in Henryville, Ind., just north of Louisville, Ky.





Henryville is like many small Indiana towns – farmland and basketball hoops attached to barns or driveways are common sights. A mere three square miles encompasses the entire town,

which is the birthplace of Harland Sanders, better known across the country as “Colonel Sanders.”

But as you are driving along Interstate 65, you’ll notice something else – a yard full of precast concrete manholes, septic tanks, box culverts and more, and a building emblazoned with S&M Precast. The highway-frontage property is a great piece of free advertising if there ever was one.

There, you’ll find Ray Graf wandering the yard early in the morning with a cup of coffee in his hand, because he’s not much of an office guy, and his wife, Becky, making sure everything is running as efficiently as the hospital where she used to serve as a nurse.

S&M has made a name for itself in Southern Indiana ever since Ray and Becky started producing septic tanks in 1995, although they never would have guessed they would be where they are today.

IT ALL STARTED WITH A TRUCK

When Ray was 23, he quit his job as a foreman for a commercial concrete contractor and start doing basement foundations. As time went on, he bought a small knuckle boom truck, affectionately called “Big Red,” to help move the panels.

“When we bought that truck, I thought it would be a great idea to have some septic tank forms,” Ray said. “Moving just our panels with that truck, it was just going to be a very limited part of the driver’s day. So, we wanted to fill the rest of his day with some activity for that truck.”

Utilizing an existing 20-foot-by-40-foot lean-to on the back of a pole barn on the farm, they started pouring. While



some people may think they’d be at a disadvantage starting in the precast industry without any experience, Becky and Ray see it as a benefit.

“When we decided to do anything, we didn’t have any knowledge of how it should be done,” Ray noted. “So, our view of how it should be done could be different than others because we’re looking at it for the first time.”

In 1999, they moved to their current location right along the interstate and increased their plant size to 40-foot-by-100-feet. They even had an “office” – an 8-foot-by-20-foot shipping container they now use for storage. Throughout the company’s growth, they continued to manufacture septic tanks and install basements until 2004 when they sold the basement business to two employees. But when the economy went south, they diversified and added new product lines.

“We had sales growth during those years,” Ray pointed out. “We were doing more products that we weren’t doing in the past, so we were able to keep our sales going positive.”

THINKING AHEAD

It doesn’t take long talking to Ray before you realize he sees the big picture differently than most, such as when they first built their plant in 1999 and installed their aggregate bins. At the time, they were pouring 10 yards per day, but decided to put in 100-ton aggregate bins in case the

S&M produced each box culvert on a skew for this project.





company expanded. They haven't had to install larger bins even with all the expansions.

In addition, he thought ahead when they built their first office building, which could only be expanded vertically. He made the decision to have a roof that could unbolt if and when they needed a second level.

"We always take a lot of time to figure out where we're headed," Ray explained. "Because once you're there, you don't want to look back and think, 'We should have done this,' or, 'Oh, we needed to do this,' or anything. So, we always put a lot of time into the thought process."

That ingenuity was on full display when they started

planning the latest addition, which was completed in 2012. The additional plant was built as a single-sloped roof so another half could be added to the building if the economy continued to do well. They even put in a door to nowhere that would open to a new catwalk that leads to an additional second floor office should they build the other half of the plant.

"You always want to plan for the next generation, the next owner or whoever," Ray explained. "It's not just about today. If you put your infrastructure in, you have to put it in for where you're going to end up, or you're going to get lost along the way."

S&M employees opened the plant to nearly 600 attendees for The Precast Show 2019 plant tour.



BIG K CABINS

While attending The Precast Show around 1996, Ray and Becky saw an exhibitor who sold liquid rubber. It was then that Ray realized that it was possible to build a concrete log cabin using the leftover old logs from the family's original house.

So, Ray made a 4 feet tall, 5 feet by 5 feet square precast log cabin just to see if the appearance looked acceptable.

Next, Ray made one log form and poured enough "logs" to stack out one whole cabin. He built his first cabin in the woods on his farm, just as a test cabin.

Once he proved the concept, he built multiple log forms for production.

Due to the demand for other product lines, the cabins never had a chance to get a spot in the new building.

The demand for other products caused S&M to reach capacity in the plant before they could market and sell the cabins to distributors.

However, they have just signed a contract with their first distributor and look forward to seeing what the demand for the product will be.

Ray's big ideas are all over the plant, too. Knowing how hard it can be to get rebar out of storage, he came up with a rolling machine that indexes rebar, so workers simply push a button to get the size they need.

Seeing his quality control technicians pick around their core samples on a normal shelving unit, Ray came up with one that would store them on their side and each day that sample would be next in line for testing. Also, he installed a ladder on their trucks that swings down to make it easier and safer for drivers to get up without having to step onto the tire.

Ray jokes that his ideas and attention to detail come from pure laziness and from filling in for other people and seeing how tough the work can be.

"We like to look at the safe way of doing things first and then making it convenient for everybody," he explained. "Concrete is not that easy of work to begin with, but we like to make it where people can do any job here, where it's not hard on the body to do them."

Sometimes, Ray's ideas need balance, and that's where Becky comes in as she jokingly refers to herself as the "pessimistic one."

"When he's coming up with all of this, I'm coming up with the other list," she laughed. "It's not just financial, but it's all the pros and cons of everything, too."

Becky credits her background as a nurse for that. It's not just about Plan B, but Plan C, D and E, too.

"He's always thinking ahead of, 'How do we create it,' and I'm always thinking of, 'OK, how do we deal with it,'" she said. "You just constantly need to be thinking. Some people don't think past that day, and I'm always thinking three times past."

ALL IN THE FAMILY

While Becky and Ray are proud of the work they've done building S&M into the plant it is today, their eyes light up when the conversation turns to their daughters. For the Graf's, family is the most important thing and it's right in the name of their plant – S&M was named for their two oldest daughters, Stephanie and Mary. And when they added a line of precast log cabins to their product mix, it only seemed natural to name it Big K Cabins for their youngest daughter, Krystal, who was not born at the time S&M began.

All three daughters can remember helping stamp envelopes, cleaning up the office, and, on the rare occasion, helping dad move products around the yard. Now, Krystal and Stephanie both work at the company while Mary is an elementary teacher. Krystal is the logistics manager, and Stephanie heads up the human resources department while doing a "little bit of everything" as she likes to say. And, the family ties don't end there – Krystal's fiancé and Mary's fiancé also work at the company, both in engineering.

Becky and Ray are quick to point out that they never pressured the girls into entering the family business, but they are elated they came to work with them. Of course, the girls don't see it that way.

"I mean when you work with your family all day, is it really work?" Krystal explained. "I feel like you can't quite call it work when come up to your place of work and you're hanging out with your parents or your sisters. You can't really get much better than that."

Stephanie likes hanging out with her family and not knowing exactly what she's going to be doing every day, whether it's inputting numbers, helping out with deliveries or running to grab spare parts. Ray jokes that she knows every parts store in the area.



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Becky and Ray Graf started S&M by making septic tanks but have expanded their product line to include vaults, manholes, box culverts, grease interceptors and more.

Walking around with Becky and Ray, it's obvious they treat employees like family as well. They are very proud of the fact they've never laid anyone off. Ray is always thinking of ways to make the job easier for staff. If employees want to come in early, work a partial day on a Saturday or need to adjust their hours so they can make a school function, they're fine with that.

"They all have the same needs that we had," he said. "As long as we're matching our production with our sales and our customers are happy, that's all we care about. It's a balancing act, but we make it work."

Ray is also quick to point out that their employees have other talents that don't include driving a truck or pouring concrete, and the Graf's try to put those talents to work in the plant.

"When we hire people, we always want to know what their hobbies are because that's something you really enjoy," he said. "When they get to do that at work, it's better for everybody."

One surefire way to know a workplace is healthy is when employees ask other family members to join them. S&M's workforce has many such ties with fathers, sons, brothers and cousins all working alongside one another. And Ray makes it a point to always listen to everyone's ideas, allowing employees to feel a sense of ownership with any changes.

"He'll take their ideas and make it into something that's workable, easy and beneficial," Stephanie said. "Everyone knows they can voice their opinion and aren't scared to say something could be better."

Of course, one of his most popular changes was adding a soft serve ice cream machine to the plant's lunchroom. Every Tuesday and Thursday from 10 a.m. to 2 p.m., ice cream is available for the employees and customers. To no surprise, customer pickups around those hours have increased.

"We always try to accommodate what our guys want," he said. "If you don't give your people what they want, they will find it somewhere else. We do have very good people here, who we owe much of our success to."

Walking around the plant and the yard, it's obvious that family doesn't end with their daughters for Becky and Ray but extends to their plant employees. And that's the key to their success. **PI**

Matt Werner is the managing editor of Precast Solutions magazine and is NPCA's communication manager.

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DON'T WASTE A GREAT OPPORTUNITY –

RECYCLE!

Are you reaping the benefits – and profits – of concrete recycling, or are you still hauling concrete waste to the local landfill?

By Shari Held

Concrete recycling is rapidly becoming mainstream, and with good reason. First, the more we recycle, the less we need to tap into our natural resources. Plus, it reduces the amount of waste being transported to our solid waste landfills. Second, it may not be possible to dump waste concrete at local landfills in the future. For example, New Jersey forbids any recyclable material to be disposed of in its landfills.¹ By recycling, you not only get rid of your concrete waste, you might be able to create an additional revenue stream for your business. Here's how one precaster created a profitable recycling center.

MATERIALIZING THE PLAN

In 2010, StructureCast, a custom precast concrete manufacturer located in Bakersfield, Calif., opened a four-acre crushing and screening plant to recycle concrete and washout. Since opening, approximately 10,000 tons of concrete has been recycled every month.

"You can't retire on it, but you can turn waste into profit," said Brent Dezember, StructureCast's president and owner.

Dezember started by talking to other businesses that had branched out and created concrete recycling centers. He wanted to get a feel for the whole process, including the equipment requirements and how profitable it could be. Six months later, StructureCast's concrete waste recycling center was open for business.

"We just kicked the idea around for a month or two," he said. "Then it took another three or four months to get all the equipment together and make it happen."

To successfully pull it off quickly, Dezember had



"Recycling is a good way to get rid of our washout material and waste and make money doing it. We don't make a ton of money, but we certainly make enough to keep doing it."

– Brent Dezember,
StructureCast

everything lined up prior to committing to the new venture.

First, he already had the extra space on StructureCast's 25 acres to locate the recycling center. But, the critical component to starting the recycling business was the strong relationships he had forged within the community over the years. Dezember, who began his career in the ready-mix concrete business, ran his plan by operators of three local ready-mix plants.

"I knew the ready-mix operators, and I knew they were having trouble getting rid of their excess materials," he said.

All three agreed to pay StructureCast to dispose of their waste material. This was crucial to the recycling center's success because StructureCast generates roughly 5% of the concrete waste material the recycling center processes. That tonnage alone wouldn't warrant opening a recycling center.

The amount of waste StructureCast hauled to the county dump wasn't excessive – only one or two 20,000-pound loads every other month. But the company was spending \$100 per load in tipping fees, plus transportation time and costs.

"It was just a nuisance," Dezember said.

Another significant piece of the plan fell into place when Dezember partnered with a local paving company that would purchase the bulk of the recycled material.

"If you're doing this by yourself, make sure you can sell the material," Dezember said. "You don't want to have a massive pile of recycled material sitting around and not be able to do anything with it. We found the outlet for selling the material first, and then figured out how to make the material."



The crushing and screening plant StructureCast set up was created primarily to recycle the remnant concrete and washout material from three area businesses.

FORGING AHEAD

One of the biggest expenditures in establishing a recycling center is the equipment purchase. StructureCast's operation required a front-end loader, a portable crusher with screening ability, stacking conveyers, two excavators (one with a crusher tip) and a 3,000-gallon water truck, which StructureCast already owned.

Once again, Dezember's relationships paid off. StructureCast's paving company partner contributed a crusher it wasn't using in exchange for a share of the profits. And an asphalt company that supplies StructureCast with asphalt waste for recycling provided two excavators at no charge.

"Getting a front-end loader was about it for our cost of getting started," Dezember said.

If you aren't as lucky as Dezember, here are a few things you should know about impact crushers. There can be significant differences among them, so look at multiple models from a variety of suppliers. A mobile-tracked crusher may be the best way to get started in the recycling business. It has a relatively low cost and can load and crush at the same time.³

It helps if you know the answers to these questions before you begin shopping:

- ▶ For what application are you going to be using the crusher?
- ▶ What kind of support equipment do you already have available?
- ▶ Who will your customers likely be and what size and grade of recycled material do they use?
- ▶ Does an electric, diesel or hybrid model make more sense for you?
- ▶ Do you need to meet emissions standards?
- ▶ Do you prefer automatic, manual or remote controls?

You'll also want to compare features such as hopper capacity, the type and quality of steel used in the frame and crusher housing and how many tons the machine can crush per hour.

CUSTOMIZING THE PROCESS

A full-fledged recycling process includes five steps: screening, pre-sizing, sorting, eliminating contaminants and crushing. But that process depends on the end product.

StructureCast was able to keep it simple. The recycled concrete it processes is not contaminated and the end material – non-specified road base – requires only crushing and screening for the required grade. This eliminates three steps: pre-sizing, sorting and contaminant elimination.

Since approximately 95% of the concrete waste StructureCast recycles comes from ready-mix suppliers, there's not much steel rebar to be retrieved. What little there is, it's pulled out by hand once the front-loader breaks up the surrounding concrete. StructureCast collects this steel in a dumpster and sells it to an iron scrap yard.

Reinforcing steel is 100% recyclable, and more than 7 million tons of scrap steel is recycled into reinforcing bars every year.⁴ According to the Concrete Reinforcing Steel Institute, more than 65% of all reinforcing bars are recycled.

StructureCast's recycling center is operated by two full-time employees, working an average of 15 days per month. One runs the front-loader, which pushes the material into the crusher. The other runs the crusher, which creates a large pile of road base from waste concrete. When the center gets really busy, a third person assists.

The paving company purchases 50% to 70% of the road base. The rest is purchased by other buyers who have heard, usually by word-of-mouth, about StructureCast's recycling center. No marketing efforts have been necessary.

MINIMAL CHALLENGES

Dezember said getting started and operating the recycling center has been "carefree and management-free." The biggest challenge he faced initially was getting the permits required by the state of California. StructureCast's recycling center is permitted by the California Air Resources Board and the San Joaquin Valley Air Pollution Control District. Be sure you know the regulations in effect in your location.

"Every place is different," Dezember said. "Some require permits

while others do not. Just make sure everything is above-board and sell to places that will use it properly.”

The main issue Dezember has with the recycling center now might surprise you.

“Our No. 1 challenge is to keep inappropriate waste from being left on our property,” he said. “We have to keep our eye on that. We don’t want to have to haul it to a landfill site.”

FINDING OTHER USES AND MARKETS

StructureCast found a ready market for non-spec road base, but recycled concrete has a second life that qualifies it for a variety of uses. It all depends on its size, shape and how it’s processed. Common uses for recycled concrete include:

- ▶ Road base for new highways or airport runways
- ▶ Paving for driveways and walkways
- ▶ Building foundations
- ▶ Pipe bedding for underground utility lines
- ▶ Landscaping mulch
- ▶ Filler for wire cages used as erosion control structures such as privacy screen walls or retaining walls
- ▶ Aggregate for creating new concrete and underpass abutments

If you have some hefty concrete elements taking up space in your plant, there are always ways and outlets to repurpose them. For example, larger precast concrete elements may be used for controlling streambank erosion or for forming the foundation for coral to build new oceanic reefs. Look at the needs of local businesses and construction projects going on in your community for inspiration.

PERFORMING ALCHEMY

If you decide to invest in your own recycling center, you won’t be transforming lead into gold, but you can transform waste into cash and help the environment at the same time.

Dezember estimates StructureCast started making a profit after six months. Now, everything’s profit after labor costs and the percentage he shares with the paving company for the use of the crusher.

“Recycling is a good way to get rid of our washout material and waste and make money doing it,” Dezember said. “We don’t make a ton of money, but we certainly make enough to keep doing it.” **PI**

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

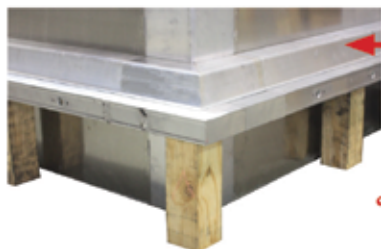
RESOURCES:

- 1 https://www.nj.gov/dep/rules/rules/njac7_26h.pdf
- 2 <https://www.recyclingproductnews.com/article/25362/the-rise-of-mobile-impact-crushers-for-recycling>
- 3 <https://www.crsi.org/index.cfm/architecture/recycling>

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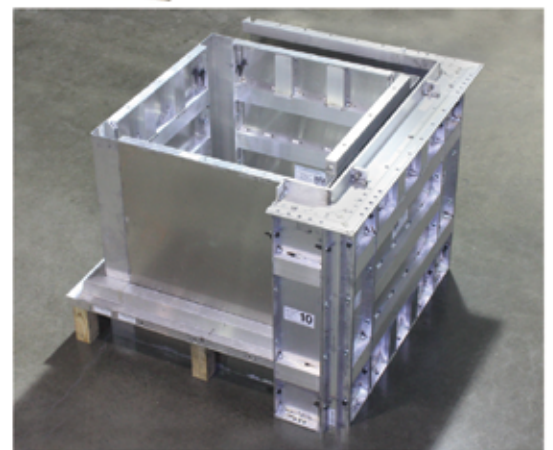


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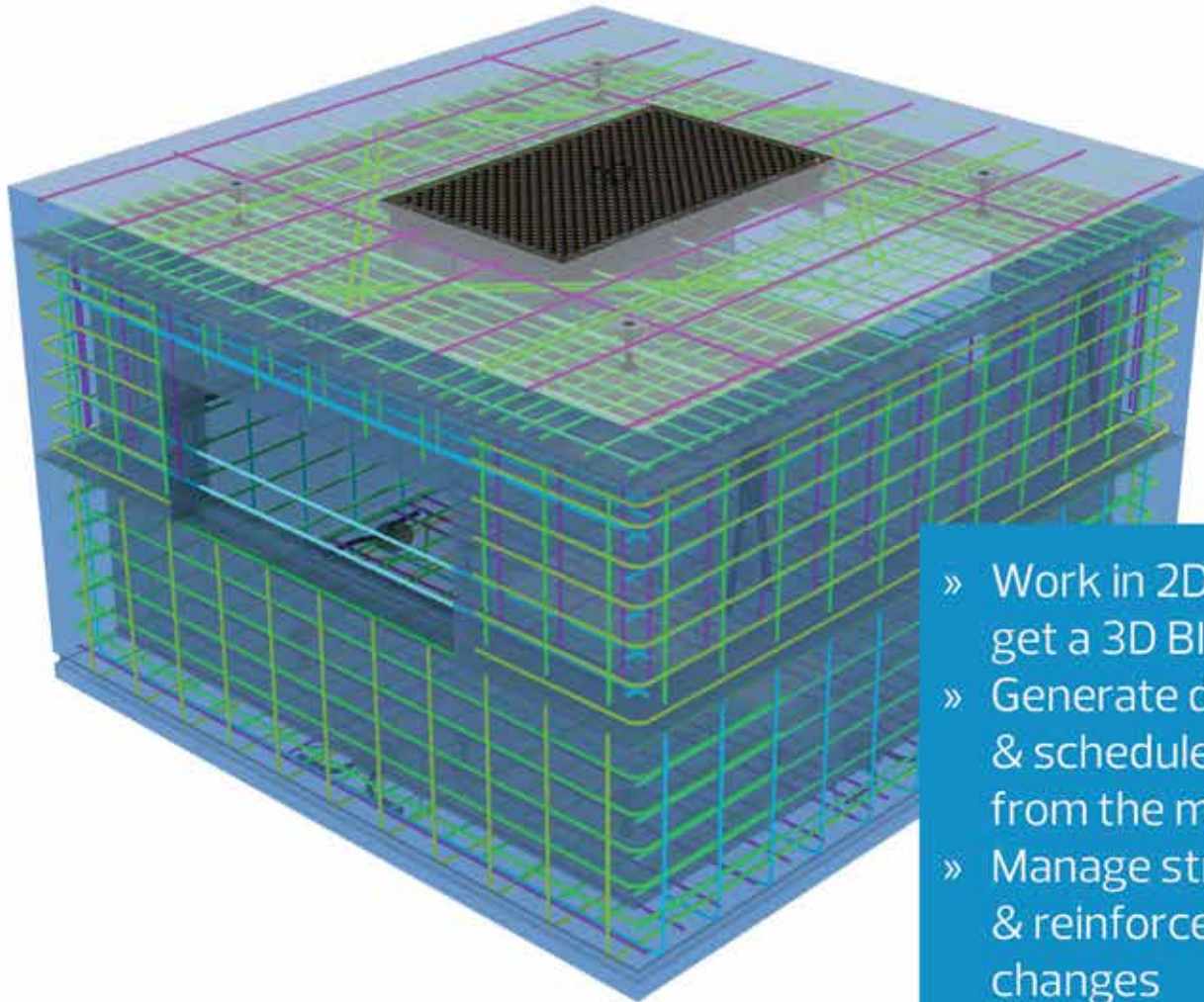


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Working For You

A Narrative Behind the Metrics

One way NPCA strives to increase the visibility of the precast concrete industry is by educating the academic community on the applications and benefits of precast concrete products and about an industry that is ripe with career opportunities.

The list of NPCA's strategic outreach activities is extensive in this arena, and so are the metrics. However, there is also a great narrative beyond just the numbers. The association's involvement with California State University, Chico's Concrete Industry Management (CIM) program and its Construction Management (CM) program provides one such story.



CIM students who won the NPCA Foundation Student Competition at The Precast Show 2019 presented their project during the patrons meeting.

NPCA professional staff have recently increased their involvement with the CIM program at CSU, Chico. In fact, a group of CSU, Chico CIM students won the NPCA Foundation Student Competition at The Precast Show 2019 in February. In addition, NPCA has previously conducted outreach at CSU, Chico. Claude Goguen, P.E., LEED AP, NPCA's director of outreach and technical education, conducted a guest lecture and general informational session to CIM students in April 2017.

In a display of continued partnership, Assistant Professor Mohammed Albahtiti, Ph.D., requested NPCA professional staff to speak to his CIM students earlier this year

and extended an invitation to attend the CIM program patrons meeting while in town. To maximize outreach efforts, NPCA reached out to faculty in the CM program at CSU, Chico and added a second presentation.

Goguen traveled to Chico, Calif., to conduct a presentation on precast concrete uses in above- and below-ground applications to an audience of nearly 100 CIM and CM students and faculty. NPCA worked with CIM and CM faculty to distribute flyers and supply information for on-campus promotion prior to his presentation.

Goguen also guest lectured for Dr. Albahtiti's course and educated more than 20 CIM students on quality control and quality assurance best practices in precast concrete manufacturing. He attended the patrons meeting later that evening – a congregation of local concrete companies and organizations that are patrons of the CIM program. The meeting included several student-led presentations, strategic planning and a tour of the new CIM lab on campus. CSU, Chico CIM students who won the NPCA Foundation Student Competition attended the patrons meeting to provide patrons with a recap of their presentation and first place win at The Precast Show.

Goguen wrapped up the trip with a one-on-one meeting with Dr. Albahtiti. The pair discussed future opportunities for partnerships and NPCA support for the CSU, Chico CIM program.

Of the 120 CIM students who attended the presentations, there were 23 requests for follow-up, six new NPCA Student Memberships, and one new NPCA Faculty Membership. Goguen made new connections within the CSU, Chico CM program as well. Lecturer Jamie Cochran and CM Department Chair Chris Souder discussed future collaboration with both the CIM and CM program with Goguen.

Additionally, Goguen showcased NPCA's



Claude Goguen presented during a general session for CIM and CM students.

newly launched webpage for students and professors. You can visit the page at precast.org/welcome.

The CIM program at CSU, Chico is geared toward concrete materials. However, there is still room for more precast content in the program curriculum. Goguen's two-day outreach excursion in Chico brought precast to the forefront and inspired students and faculty to seek additional information, stay in the loop and inquire about future collaboration. In addition, the NPCA Foundation provided a \$12,000 grant to Albahtiti to create the first-ever CIM precast-specific course, which is required for CSU, Chico CIM graduates. The course finished its first semester. These interactions allow NPCA to build relationships that will facilitate a stronger presence of precast among future decision makers and the incoming trades workforce.

The association's outreach metrics illustrate significant movement in the right direction. However, there is no limit for success when it comes to making an impact. We encourage members to collaborate with NPCA on efforts to make connections and build relationships in local academic communities. NPCA professional staff is happy to assist in providing guidance, resources and staff for your outreach endeavors. Contact Ashley Benson, education outreach coordinator at abenson@precast.org for assistance. **PI**



To learn more about how you can teach the benefits of precast to future specifiers or help professors incorporate precast into their curriculum, watch the NPCA Precast Learning Lab video, "Building Education Relationships," at precast.org/learning-lab

NPCA Membership

Features Volumes of Benefits

By Matt Werner

National Precast Concrete Association membership is about more than just connecting with other precast concrete manufacturers and suppliers. NPCA members have access to a wide variety of tools to empower employees, create high quality products in the safest manner possible and much more.



EDUCATIONAL OPPORTUNITIES

One of the biggest benefits of NPCA membership is access to a variety of educational opportunities. These educational tracks are designed for all employee positions from the plant floor to management.

The NPCA Online Learning Center features one-hour webinars on production, quality, safety, marketing, sales and human resources. These precast-industry-specific webinars are perfect to use as refresher courses for existing employees, training new hires or even conducting lunch and learns for local specifiers in your community. New topics are added each month, and there are more than 100 videos already in our library.

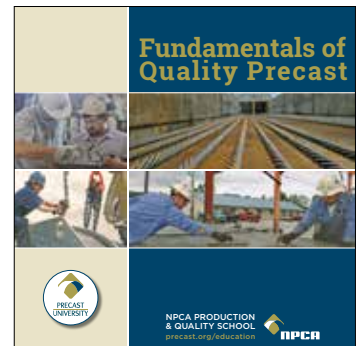


NPCA's Precast Learning Lab videos are another great option for online instruction. The videos cover precast production best practices and marketing and sales.

In 2018, we added new videos on aggregate moisture content testing, cage fabrication and two marketing topics.

You can also take advantage of our in-person educational opportunities at The Precast Show and Annual Convention. These courses, along with our online offerings, help plant employees enhance

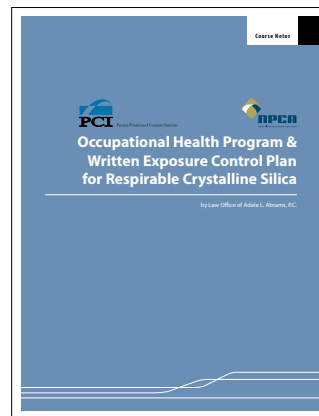
their skills and further their careers. In addition, there is the Production and Quality School track that is known as Precast University. Those who complete the curriculum earn the Master Precaster designation. The courses include technical best practices, quality control, production, safety and leadership. Training your staff through Precast University courses helps create a skilled and stable workforce that pays dividends. Plants with one or more Master Precaster are equipped to achieve better quality, higher efficiency and greater safety – with lower turnover. The price for the foundational training course, PQS Level I, was recently reduced to just \$99, making it the best training value in the industry.



SAFETY RESOURCES

In an industry rife with potential hazards, it's imperative our members create and maintain a high standard of safety in the workplace.

NPCA's fast-paced safety training videos are designed to grab the attention of viewers by focusing on specific topics in a visually compelling way. Available in both English and Spanish, the video series offers an effective way to highlight safety with your team in a lunch and learn or safety toolbox talk format.



Due to OSHA's 2017 silica exposure rule, which cut permissible exposure levels in half and instituted other new requirements, we created several resources to help our members comply with the new rule. From documents to videos and webinars, we want to ensure your plant is in compliance. We worked with the Precast/Prestressed Concrete Institute to produce a comprehensive precast-specific silica exposure

control manual to help you meet the standards.

OSHA's crane operator certification requirements have been a source of questions and uncertainty in recent years. The new rule took effect on Dec. 9, 2018, and full enforcement began April 15. Crane operator certification depends on the type of equipment and the tasks performed by the operator. By working with OSHA and accredited third parties, we created precast-specific resources to help our members comply with these complicated standards.

TECHNICAL GUIDANCE

Ensuring our members make high quality precast concrete products is our main goal at NPCA, and we want to make sure we give our members all the tools they need to run a successful business.

NPCA members gain access to briefs, notes, white papers and a series of references that describe the best practices in quality precast concrete production. The cornerstone of these resources is the NPCA Quality Control Manual for Precast Concrete Plants, which serves as the guide for our plant certification program. Another key publication is the annual collection of ASTM standards specific to the precast industry, which is available in the NPCA Shop.

In 2018, we also published the latest edition of the Manual for Jointed Precast Concrete Pavement, which can be downloaded free on precast.org. The manual is a comprehensive technical document describing jointed precast concrete pavement systems in detail and presents a step-by-step guide that can be used by departments of transportation, system designers, precast concrete manufacturers, contractors and inspectors. The manual includes dozens of technical illustrations, charts and photographs.

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TAKE ADVANTAGE

NPCA Membership doesn't just mean a stamp on a product or being able to connect with others in the industry. It's a commitment to producing high quality products and giving your employees the tools they need to be more effective at their job.

With so many benefits, the only question is, what haven't you taken advantage of yet? **PI**

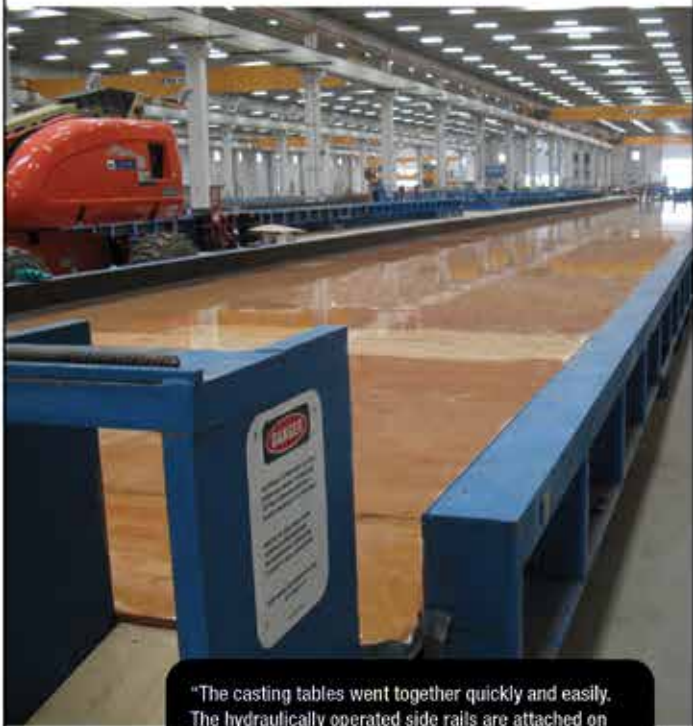
Matt Werner is the managing editor of Precast Solutions magazine and is NPCA's communication manager.



7 CASE STUDY

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The Right Approach Makes a Difference

By Sara Geer

Company support inspired **Alfredo Lara** to continue working at Panhandle Concrete Products and attain his **Master Precaster** designation.

If someone told Alfredo Lara while in college that he was going to work at a precast concrete plant as a quality control technician, he would have thought they had gone mad. However, life has a funny way of changing a person's plans.

"In college, I got a bachelor's degree in construction management and my whole thought process in school was, 'I'll do any type of construction except for concrete,'" Lara said. "I always thought I would be building houses or doing industrial construction."

After graduation, Lara applied for an industrial job in Tucson, Ariz. The job fell through, however, when a project bid was not contracted, causing the company to stop hiring. He found temporary work at the Nebraska Department of Roads inspecting and patching roads, which was his segue to working with concrete.

"I then got laid off in December, but at the same time Panhandle Concrete Products was hiring," he said. "So, I started off as a laborer just to get some money in my pocket, but was thinking, 'Oh, I'll probably stay three months and then see what happens.'"

Right when he was contemplating turning in his two-week notice, QC and Production Manager Andy Hayward offered him a crew leader's position. Lara talked with his family and decided to stay. After 11 months, he became Panhandle's new QC technician. During the first couple years on the job, his doubts about working at Panhandle Concrete returned.

"This was a hard transition for me," he

said. "The first 2 to 3 years were tough and there were times where I felt like this wasn't for me. But anytime I felt that way, management would remind me, 'Hey, no one is perfect, and this is not an easy job.'"

The job's difficulty is actually what inspired him to take Production and Quality School Level I in 2015. Hayward suggested the course would help him understand his job better and answer the many questions he had.

"We try to be as supportive as we can to our employees," Hayward said. "Sometimes they might be faced with obstacles or a tough job that they haven't experienced yet, so it's important to keep them from getting too wound up and keep them focused on the task at hand. I think a lot of that can be accomplished through education like the Master Precaster program.

"It's important to offer these opportunities and see them succeed as employees, so they can transition that to the rest of their lives outside of work as well."

Lara said he learned a lot from PQS I, specifically about problems he thought were unique to Panhandle, such as finding reliable workers and concrete testing. Those issues, he found, are common throughout the entire industry. After finishing the first course, that taste of knowledge fueled his desire to take more classes.

Although classes like PQS II - QA/QC and PQS II - Technical were very valuable in teaching him the math, mechanics and reasoning behind being a QC technician, the PQS III - Leadership course was his favorite. Lara said it helped him be a better leader in the company by increasing his confidence in his abilities to communicate well with others and problem solve. These are both important aspects of his job since he refers himself as the "middle man" situated between management and the production staff.

"I'm trying to help everyone and get the job done right because essentially my initials are on



each approved product,” Lara said. “Andy is always telling me, ‘Right now, you are the face of the company because you are the one getting your name out there.’ I try to help the staff understand why our bosses want it this way and why we must meet these standards.

“It’s hard sometimes for the employer to communicate that to them, so that’s my job.”

Hayward said that since Lara has gone through the Master Precaster program, he has seen a positive shift in the overall morale of other employees. He encourages each employee to take what they learned from a class and put it to use in their job. The company tries to implement new ideas when it can because there is always more than one way to do most jobs.

“The older I get, the more I see the importance of continuing education because if you get too complacent in what you are doing, you’ll lose some desire for your job,” Hayward said. “You need to make changes to keep up or keep ahead and education is the best way to keep people informed, improving themselves and their company.”

Lara has appreciated the support he has received from the entire company. He was especially grateful that management made the decision to stop production for a day to bus the entire workforce to The Precast Show in Denver to attend his graduation and watch him receive the symbolic gold

“Now that I’ve increased my knowledge and confidence in my job, I pass that same encouragement along to my coworkers to help them as well.”

– Alfredo Lara

hardhat as Panhandle Concrete’s first Master Precaster. Since then, Andy’s brother Chris Hayward has completed the program, while another employee is scheduled to graduate in 2020.

“A couple years ago, we weren’t doing a lot of continuing education, but now we’re doing it more and more as time goes on,” Hayward

said. “It’s something that I encourage all companies to take part of when they can. It may not be too feasible right away for some, but when you get the chance, it’s good to get your employees involved because it will benefit you and your plant.”

In addition, a company that can provide the encouragement Panhandle Concrete has shown Lara throughout his career may likely change an employee’s mind about leaving.

“I honestly would not have stayed without the company’s support in me,” Lara said. “They believed in me when I didn’t believe in myself because when a QC manager makes a mistake, it can look very bad. When I catch a mistake too late, I own up to the mistake and management often gives me more encouragement.

“And now that I’ve increased my knowledge and confidence in my job, I pass that same encouragement along to my coworkers to help them as well.” P

Sara Geer is NPCA’s communication manager, and is managing editor of Precast Inc.



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Elematic Adds New Machine

Elematic has introduced a new machine, the Extruder E9, for hollow-core slab production. The new machine offers high casting speed, automatic compaction control and bouncing prevention. In addition to standard hollow-core slab production, the new design of the machine will also enable casting of a variety of precast slabs.



Extruder E9

Easi-Set Welcomes Seasoned Executive to National Sales Team

Easi-Set Worldwide announced the hiring of Mark Chinery as U.S. Regional Sales Representative. Chinery will work collaboratively with Easi-Set President Art



Mark Chinery

Miles and key management in the development and execution of sales plans to increase market share for Easi-Set's licensed products.

Chinery has had a long career in

both precast concrete and manufacturing. His ongoing commitment to further his precast manufacturing knowledge includes graduating from the National Precast Concrete Association Master Precaster program and prior service on the NPCA Board of Directors. He is also a certified LEAN Six Sigma Green Belt.

Oldcastle Infrastructure Expands Leadership and EHS&S Team

Oldcastle Infrastructure announced Wendy Race joined the leadership team as vice president of human resources and Ray Gabriel joined as the area general manager for Colorado.

Race will lead all HR and benefits programs. She brings more than 20 years of human resources experience from General Electric Co. Gabriel joins with more than 15 years of business and operations leadership, including a distinguished military career, having served more than 10 years in the U.S. Army where he was awarded the Army Bronze Star Medal for leadership and meritorious service in Afghanistan.

The company also expanded its environmental, health, safety and sustainability leadership team. Shaun Larsen will serve as the West Region EHS&S director, while Todd Ravazza becomes the Northern California EHS manager. Catherine Lyden will lead as the Central Region EHS&S Director, and Lisa Sharp as the EHS Manager for Colorado, Oklahoma and Kansas. Kevin Hudson heads the East Region as EHS&S director, and Justin Meador as the EHS Manager for Pennsylvania, Maryland, Virginia, Kentucky and Tennessee.



Doug Moore

Command Alkon Adds Cloud Platform Strategist to Leadership Role

Command Alkon announced the addition of Doug Moore as vice president of its

cloud platform. In his role, Moore will head the company's long-term technology vision, be responsible for the cloud platform and drive key cloud technology topics such as scalability, security, analytics and information access.



Bearcat Bolt

Dayton Superior Releases New Product

Dayton Superior has added the Bearcat Bolt to its inventory. The Bearcat Bolt is a multi-use drill-in screw anchor specifically designed for high-strength load capacity needs. The product is available in 5-inch and 7-inch bolt lengths. It works in a wide variety of applications and is compatible with 3/4-inch drilled holes.

GCP Applied Technologies Named PCI Associate Member of the Year

GCP Applied Technologies announced it has been awarded the 2019 PCI Associate Member Award by the Precast/Prestressed Concrete Institute. The award is PCI's highest honor for a supplier member. GCP has been a member of PCI for more than 40 years and is committed to supporting the precast industry.

Tindall Corp. Establishes New Engineering Office

Tindall Corp. has relocated its corporate engineering team to a new office in Duncan, S.C. The building provides ample



Tindall Corp. engineering office

space for future growth and expansion of the company's design and engineering capabilities. The team will continue to provide engineering and design support to Tindall's six divisions that serve the Mid-Atlantic, Southeastern and South-Central United States.

ConShield Technologies Announces Parent Company Acquisition

ConShield Technologies announced the acquisition of its parent company, Waterline Renewal Technologies, by private equity firm Behrman Capital. The acquisition provides improved commitment and support to its customers and the municipalities, counties and commercial entities it serves. **PI**

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CALENDAR OF EVENTS



Oct. 3-5, 2019
NPCA 54TH ANNUAL CONVENTION
 Hyatt Regency Seattle
 Seattle, Wash.



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.



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