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VETERANS MEMORIAL

by Wieser Concrete Products

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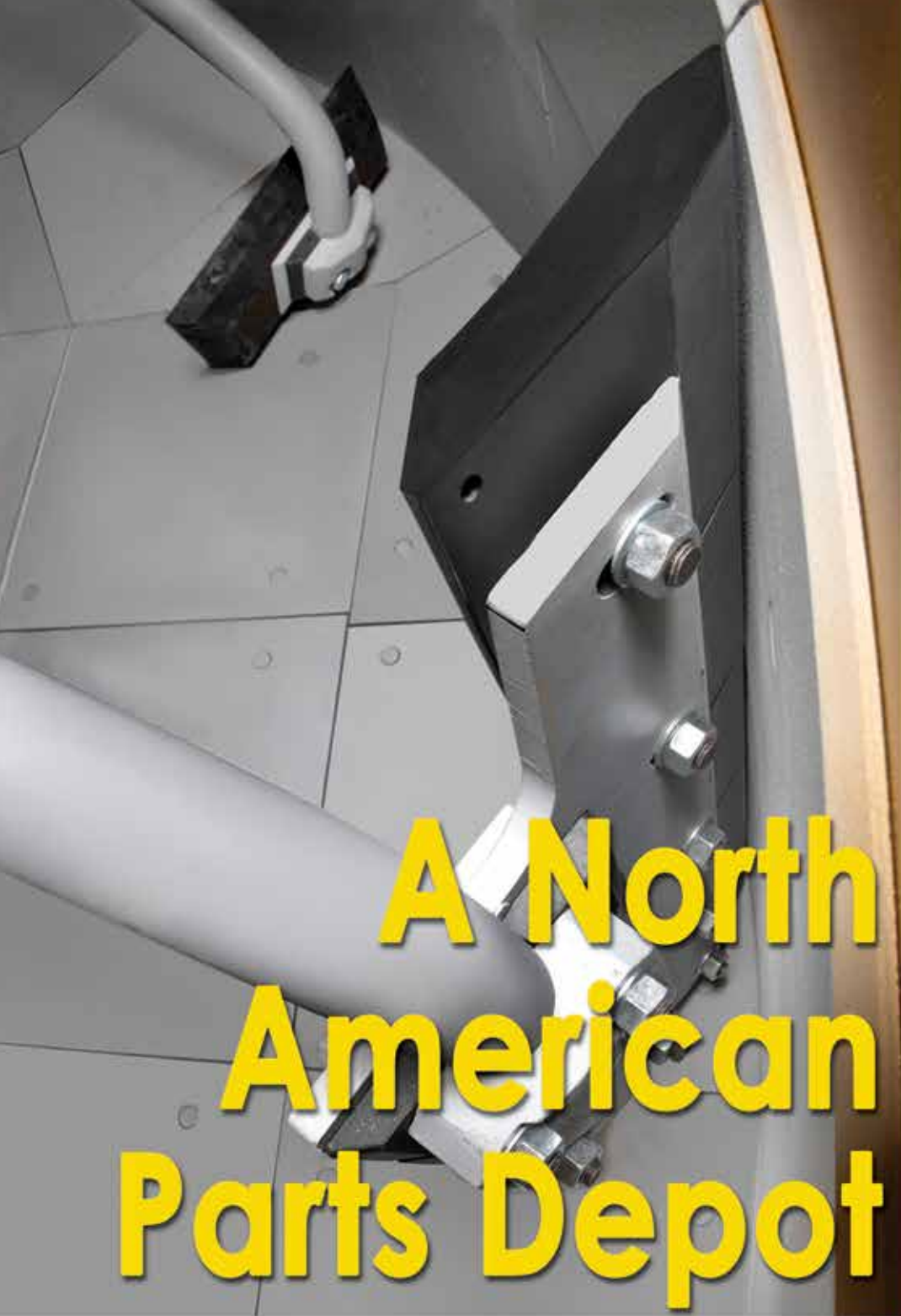
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12



32

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NPCA is a trade association representing the manufacturers of plant-produced concrete products and the suppliers to the industry around the world.

32 A CITY'S TRIBUTE

Duty, Honor, Country

Wieser Concrete Products manufactures precast kiosks and signage to honor an Illinois town's war veterans.



4 PRECAST PIONEERS
Joe Wieser

6 TOP 10 FACTS ABOUT DRY-CAST CONCRETE
Important facts about working with low water-cement ratio concrete

12 WORKING WITH EPOXY-COATED REBAR
How to use fusion-bonded, epoxy-coated rebar in precast concrete applications

16 PLACING AN EMPHASIS ON SAFETY
NPCA's Strategic Plan

18 EXTREME PRECAST
Precast concrete gives control in the face of many uncontrollable variables in extreme situations

BUYER'S GUIDE!
page 52

22 MATERIAL MATTERS
Fly Ash

26 IMPLEMENTING EMAIL USAGE POLICIES IN THE WORKPLACE
If you're not already using an established policy, now is the time to develop one

42 GREEN PIECE
Taking sustainability below the surface

46 FOUNDATION NEWS
Josh Gaines

48 PEOPLE & PRODUCTS

50 NPCA CALENDAR ADVERTISERS INDEX



Do you have an email usage policy? You should!
page 26

On the Cover:
Wieser Concrete's plant in **Roxana, Ill.**, manufactured five kiosks and two signs for the City of Highland, Ill.

photo by Scott Evers Photography



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Precast PIONEERS

Joe Wieser, NPCA President, 1985



Joe Wieser with his Robert E. Yoakum Award, 1981.

1.) Tell us what the precast industry was like when you got started.

Before I became involved in the precast concrete industry, I was a dairy farmer who had grown up on a farm. After completing my military obligation, I began farming on my own. I decided to change careers after seven years. At the time, my father had a small precast business making septic tanks. So, I moved 100

miles from home to set up my own septic tank manufacturing plant.

The state of Wisconsin was changing specifications for septic tanks that required them to be watertight and one piece below water level. We checked with several form manufacturers. My father had designed and built our own septic tank and drywell forms. We used my father's designs and started to learn more about concrete products. All I knew at the time was that mixing cement, sand, gravel and water made concrete. We used extra cement in our mix and our septic tanks were a higher quality than our competitors. In six years, we had the majority of business in our area.

As business prospered, we kept getting more requests for more precast concrete. At the time, I received a lot of help from engineers of our cement suppliers, plus the Portland Cement Association had an engineer assigned to the agricultural market and our admixture suppliers. These men spent a lot of time at Wieser Concrete designing products and different mixes.

We then received a one-page flyer in the mail about a group having a meeting in Buffalo, N.Y., for an organization of precast concrete producers. We were a group of concrete manufacturers interested in advancing our industry. In the early years, I was also involved with ASTM establishing the standards for our industry.

2) How has precast as a product changed over the years?

Over the years, precast concrete has become more exact and of higher quality. There is still a lot of work to be done for owners, engineers and suppliers to think about precast concrete first before other industries. Plant certification has done

a lot to improve the image of precast concrete. It has also helped get precast concrete specified and accepted on many jobs.

3) Why did you get involved with NPCA and decide to become chairman?

We got involved with NPCA at our first meeting in Buffalo, N.Y. Everyone we met was so kind to us. We asked a question about precast concrete and they would answer us. They all wanted to help this farm boy from Wisconsin. My relationship with the early founders of NPCA grew from there. At first, I was the Agricultural Products chairman. I also served as the chairman of Production and Distribution Committee for many years.

The first meeting to start plant certification was held in my motel room in Denver, Colo. In the early years, the Portland Cement Association assigned a person to work with NPCA on advertising and marketing. For two years, this person from PCA, Bob Walton with NPCA, and I met at O'Hare Airport once a month to work on marketing for NPCA. The reason I became so involved was because the more involved I was with NPCA, the more I learned from the people I was working with. Bob and Janet Walton were very family oriented. Our wives were always welcomed at our activities. Becoming chairman was a natural move after serving on the board for three terms.

4) What was the best thing you accomplished as a chairman?

I became president or chairman during the time Bob Walton was positioning himself for retirement. The association was moving to a full-time president and staff. The Board and Planning Council spent many hours discussing the services

EDITOR'S NOTE:

NPCA will celebrate 50 years at its Annual Convention in Minnesota this October.

This year-long series honors past chairmen who helped establish the association as a leading voice for the precast concrete industry.

NPCA should provide for its members. I also served five years on Long Range Planning Council, where all ideas were discussed in detail at a three-day meeting.

5) How did the friendships formed via NPCA impact your business and life?

NPCA became a very big part of our social and family life. Our family scheduled our life around the family business. Our children have many lasting friends around the association. The parents are friends of ours. Now, the children carry on the tradition, like with the Lindsay, Gavin and Vaughn families. When we went on motor home trips, we always stopped at precast plants.

6) What's your favorite NPCA memory?

My favorite NPCA memory was the year I received the Yoakum Award, Gimmicks and Gadgets Award, and was elected secretary/treasurer all in the same

convention. One of the main things NPCA did was the many study tours of Europe, England, Scandinavia, Japan, Australia, New Zealand and BIBM conferences we attended. I learned so much about plant design and business management. We would all get back in the bus and discuss what we saw. I also remember the time E.C. Babbert and I went to a meeting in Chicago about septic tank design at the Hilton. E.C. did not have a room so we shared my room. The room was so small we could not get out of bed at the same time.

7) When you first got involved with NPCA, did you envision it becoming what it is today?

When I first got involved with NPCA, it was a group of precasters working together to help themselves and the industry.

No, I am not surprised how the association has grown and moved forward because of the attitude of the



Mary and Joe Wieser

members wanting to help each other and themselves. There still is a lot of room to grow. Mary and I cannot thank NPCA enough for all the long-term friendships and all the help growing our family business. **PI**

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TOP 10 Facts about **Dry-Cast Concrete**

By Eric Carleton, P.E.

Concrete is one of the oldest and most widely used building materials in the world. Some of the earliest concrete structures were built by tradesmen in the Middle East more than 8,000 years ago. When constructing the underground concrete water cisterns, they had already learned that the key secret of quality concrete is to keep the water-cement ratio as low as

possible. Today, precast manufacturers continue to rely on this secret to produce quality concrete. One such product that depends on a low w/c ratio is dry-cast concrete. A dry-cast mixture has just enough water to initiate cement hydration within the range of 0.30 to 0.38 without the use of admixtures. Below, several important facts regarding dry-cast concrete are outlined.

1 INCREASED PRODUCTION

One benefit of using dry cast is it can be consolidated within a form. The stiffness of the mix allows the form to be immediately stripped. The product will stand under its own weight to complete the curing process and the form can be returned to cast another product.



A dry-cast mix design allows Concrete Systems Inc. production staff to manufacture concrete barriers at a high-pace.

2 REDUCED SHRINKAGE AND CREEP, RAPID STRENGTH INCREASE

In 1969, The Aberdeen Group published an article titled, "An Introduction to Dry-cast Concrete," that introduced the process. All the concrete components are placed into the formwork dry, then compacted and lastly, infused water is added into the mix via capillary action to start hydration. Though this process of dry casting didn't catch on commercially, the article described the reasons for the positive attributes of dry-cast concrete: "Both shrinkage and creep are reduced because all of the aggregate particles are in contact with each other, instead of being separated by the cement-water paste formed in the wet-mix process of producing concrete. The already compacted aggregate particles must of necessity resist the shrinkage of the cement, with the result that the particles

are preloaded to increase the compressive strength of the concrete."

Modern dry-cast concrete processes introduce water during mixing prior to vibration. The low amount of water and corresponding paste combined with consolidation from external vibration provides the same reduced separation of aggregates. Consequently, the same attributes described include a rapid increase in compressive strength. In some cases, dry-cast products can comply with specified material strength requirements in 24 hours.

3 DRY-CAST CONCRETE ≈ ROLLER-COMPACTING CONCRETE

Although dry-cast concrete mix designs and applications have been used for decades within the precast concrete industry, the batching method is rarely discussed in concrete engineering classes. In fact, zero-slump concrete testing is not included in ACI Level 1 technician certification. With the expanded use of roller-compacted concrete for paved surfaces, dry-cast methods are now becoming more popular with engineers. Many of the same attributes associated with dry-cast concrete are present with RCC.

4 VIBRATION: NOT ONE SIZE FITS ALL

One of the primary keys to quality dry-cast concrete products is consolidating the mix with intensive external vibration, because the stiffness of the mix makes traditional internal vibration impossible. Dry-cast products need to be consolidated through a variety of methods. One is the use of centrifugal force and mechanically packing the mix into the outside form jacket with the use of spinning cylindrical heads. The method is similar to the packer-head pipe-making process. The other more conventional methods are via individual external vibrators attached to the product form or the entire form attached to a vibrating table. Both vibration processes are designed to consolidate the mix to the maximum density.

For optimal use, precast concrete producers need to be aware that the energy provided by vibration technology needs to be directed to the concrete mix. Additionally, different products may require different vibration settings to insure the

consolidation energy is adequate for the product being cast. For example, a small short inlet section may use a vibration with high frequency but low amplitude, while a large 8-foot-tall manhole section may need a higher amplitude setting and lower frequency to evenly distribute the energy throughout the product mass.

5 A HEAVY-DUTY FORM, ALL DAY LONG

The need for heavy-duty forms is twofold. Due to the need to transfer intense external vibration energy to the mixture through the formwork, dry-cast forms need to be very rigid. This does not simply mean thicker skin, as increased jacket thickness can lead to dampening as a result of vibration energy. Similarly, simply adding structural steel stiffeners can also be detrimental. Adding more weight to a form reduces the effectiveness of the vibration methods employed.

Heavy-duty forms are typically used continuously throughout the day's production. The primary benefit of using a dry-cast process is the ability to produce multiple precast concrete sections using a singleform system. Consequently, that single form is handled repeatedly throughout the day with setup, pouring, vibration, transportation to curing and setup areas and product stripping. A dry-cast form must be designed to handle all that use, yet not be so bulky to reduce the consolidation effectiveness. Proper form design is an engineering art optimizing the highest form stiffness and ruggedness with the lowest form weight.

6 LET A LITTLE OUT AT THE BOTTOM

It is not always recognized or understood that most dry-cast products' wall surfaces are not perfectly vertical. A slight taper of the product is required to accommodate immediate stripping. For traditional wet-cast precast operations, the concrete mix is cast and internally vibrated into the forms and cured overnight. The product is then hardened when the forms are removed.

Typically, to assist with stripping, the forms are hinged on the outside with latches to open and are collapsible on the inside. However, many dry-cast outside jackets or inside cores are fabricated as a single-steel section. Consequently, to

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A heavy-duty form is needed to manufacture dry-cast precast concrete products.

physically pull out either the form from the cast product or the cast product from an anchored core or jacket, the form must include a slight taper. This reduces the continuous skin friction of the lift and the potential vacuum suction that would occur with vertical-facing forms. This taper is typically only 1/8 to 1/4 inch over the length of the wall and has minimal effect on product function. However, this small variation should be noted if the exact product perimeter or circumference is needed.

7 LEAVE THE SLUMP CONE IN THE CLOSET

When speaking to a precast manufacturing friend who lives in the Chicagoland area on this subject of dry-cast facts, he said, "Unlike the Cubs, dry-cast concrete doesn't slump."

Dry cast is known as zero-slump or negative-slump concrete because with typical mix designs, additional water could be added and the slump would still be zero if tested in accordance to ASTM C143, "Standard Test Method for Slump of Hydraulic-Cement Concrete." In fact, the mix is so stiff that the tamping rod simply would leave a hole when extracted.

A true story regarding slump testing and dry-cast concrete occurred at a concrete pipe plant in the Midwest. During an unannounced inspection by the owner's

engineer, a slump test was requested. When the plant manager said they did not have a slump cone, the engineer lambasted him about the company being inept by not conducting daily slump testing. After accepting a little more abuse, the plant manager answered while pointing at the 2 full kilns of 24-inch-diameter-by-8-foot-tall sections of pipe made that day, "Look, I just did 300 slump tests today, if the mix is off, they all fall down!" The engineer learned something new about dry-cast concrete that day.

8 LEAVE THE AIR TESTER

It is extremely difficult, if not impossible, to use air entrainment admixtures to produce a controlled air content of a finished dry-cast product. It is believed the high-intensity vibration and consolidation of the mix collapses the entrained air bubbles. However, precast concrete products that use dry-cast processes have shown complete resilience to freeze-thaw degradation, which can occur with mixes of higher w/c ratios. Thousands of precast concrete pipes and box culverts project out of roadway embankments in highways and are exposed to severe freeze-thaw environments, yet they hold up to abuse. Canadian testing company, Service d'Expertise en Matériaux Inc. confirmed this through formal research. The study

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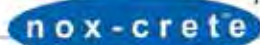
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A dry-cast product can be immediately stripped from its form and can stand on its own to complete the curing process.

conducted an extensive literature review that showed properly made dry-cast concrete resisted frost-induced cracking. Additionally, dry-cast pipe and box culvert products proved to meet the requirements of ASTM C1262-97, "Standard Test Method for Freeze-Thaw Durability of Manufactured Concrete Masonry Units and Related Products."

9 RUNNING ON ALL CYLINDERS

Though dry cast is not conducive to testing for slump or air, a producer still needs to make and test concrete cylinders for testing in accordance to the product specification. However, the method of fabrication for these cylinders varies greatly from the traditional wet-cast concrete mix means to make a test cylinder described in ASTM C33, "Standard Practice for Making and Curing Concrete Test Specimens in the Field." It is important to know these differences. More information can be found in the July-Aug. 2014 Precast Inc. article "Compress for Success."

10 PRODUCTION SAVINGS & SPEED OF FABRICATION

If the market for the precast product is great and the product to be made can be standardized, then the initial expense of the dry-cast forms and production equipment can be justified. As described by Mark Wilson, plant manager at Cretex Concrete Products, "The economic factor (of dry-cast production) can't be ignored. Man-hours per ton and form costs over time can be attractive, as well as, a quick response time in serving the customer."

QUALITY REQUIRED

As discussed, dry-cast mix and production methods provide many advantages. New admixture technology has also introduced game-changing properties to wet-cast concrete, including the rapid application of self-consolidating concrete within the precast industry. However, regardless of your production methods, always make sure it is quality concrete. **PI**

Eric Carleton, P.E., is NPCA's vice president of Technical Services.

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Photo courtesy of CRSI

Working with EPOXY-COATED REBAR

One of the most common methods of combating steel rebar corrosion in precast concrete applications is the use of **fusion-bonded, epoxy-coated rebar** in construction and repair.

By Phillip Cutler, P.E.

Above: Epoxy-coated reinforced rebar provides corrosion resistance that extends the service life of precast concrete products.

According to the Concrete Reinforcing Steel Institute (CRSI), epoxy-coated reinforcing steel was first used in a bridge application in Pennsylvania in 1973. Why 1973? Well, earlier in our infrastructure history there was less concern about vehicles sliding on icy roads or snow and ice removal during the winter. It wasn't until the 1950s that deicing chemicals were used to clear bridges and highways, but the result of using these chemicals sent repair costs skyrocketing due to corrosion problems. The country needed a better solution

to reduce the problem and, out of many protective-coating options tested, fusion-bonded epoxy coating of rebar was the best fit.¹

MATERIAL SPECIFICATIONS

When precast project specifications call for the use of epoxy-coated rebar, precast concrete manufacturers need to be armed with the appropriate ASTM standards in order to satisfy contract documents and owner demands. The most widely used ASTM standards covering epoxy-coated

rebar are ASTM A775, “Standard Specification for Epoxy-Coated Steel Reinforcing Bars” and ASTM A934, “Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.” The difference between these two standards is one key word – prefabricated. ASTM A775 covers fusion-bonded epoxy coated bar lengths while ASTM A934 covers fusion-bonded, epoxy-coated bar that is cut and bent into specific required shapes, sizes and lengths such as stirrups and hooks. This occurs prior to cleaning and the powder-coating application.

MANUFACTURING EPOXY-COATED REBAR

Epoxy-coated rebar is manufactured in CRSI certified plants under strict controls for cleaning, pre-heating, electro-powder coating and curing processes. Bars are cleaned by grit blasting to remove all mill scale and oxidation and then electro-induction heated to around 450 F. The bars and specialty shapes then go through an electrostatic powder-coating process. The heat of the bars and shapes causes the powder to melt on contact, forming the polymer coating. In the final stages of the process, bars are air and/or water cooled prior to removal from the manufacturing line. This cooling process allows the bars to be handled and stacked without damaging the epoxy coating. Danielle Kleinhans, Ph.D., P.E., certification program administrator and structural/transportation engineer at CRSI, said CRSI’s certification program for the application of epoxy coating on reinforcing steel has been in effect since 1991. The program outlines basic requirements for the quality

control program to ensure a plant and its employees are trained, equipped and capable of producing epoxy-coated rebar. Today, 38 certified plants are part of the coating certification program, and they have recently established a certification program for fabricators of epoxy-coated reinforcement as well.

“Most epoxy-coated rebar produced in the country is coated by CRSI certified plants, so the chance a precast concrete producer is receiving domestic, non-certified product is slim,” she said. “We view that as a good thing.”

HANDLING AND STORAGE

When handling epoxy-coated rebar, plants must take special care not to damage the coating. Handling requirements are covered by ASTM D3963. Using nylon strapping and multiple lift points along the bar will help to ensure the coating is not marred or damaged by cables or chains and is not allowed to sag and rub during offloading. Epoxy-coated rebar needs to be stored separately from non-epoxy-coated rebar and proper protective measures such as storage on wooden racks or plastic or rubber-coated steel racks avoids the possibility of surface damage. Bars that have damaged coatings need to be repaired using an approved repair material and process prior to being placed in formwork. If stored outside, Epoxy-coated rebar needs to be protected from direct sunlight – ultra-violet light degrades the epoxy coating over time – by tarps and/or covered storage areas. CRSI recommends that bar be exposed to ultra-violet light no longer than 30 days unprotected, Kleinhans said.

PRECAST CONCRETE APPLICATIONS

Bridge & Roadway Products

- Bridge decks and abutments;
- Approaches and barrier rails
- Bridge beams and girders
- Parapets
- Paving Slabs

Marine

- Pile and pile cap
- Beams and support structures
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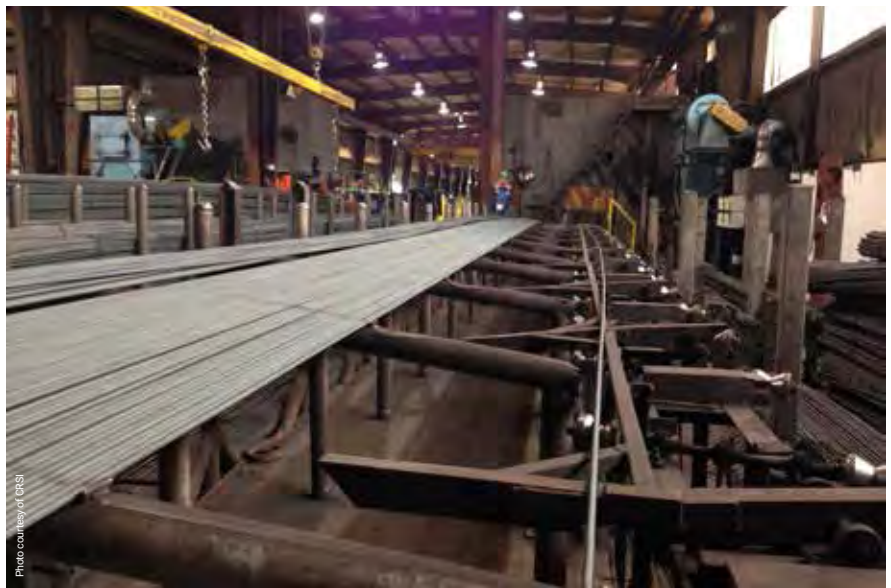


Photo courtesy of CRSI
 Thirty-eight CRSI certified plants manufacture epoxy-coated rebar.

CAGE FABRICATION AND FORMWORK

When assembling reinforcing cages using epoxy-coated rebar, technicians should exercise care in assembly as to not damage the epoxy coating. Fabrication of cages should be accomplished using appropriate coated tie wire. Cages can be supported in the proper position in the formwork using plastic chairs and stand-offs and/or precast concrete spacer blocks as with conventional black bar applications.

DESIGN CONSIDERATIONS

Designers of structures using epoxy-coated rebar usually follow the standard recommended practices of ACI and AASHTO. However, plant personnel should be aware that laps and splices for epoxy-reinforcing steel need to have larger lap and development lengths due to the bond differences between conventional black bar and epoxy-coated bar.

APPLICATIONS FOR EPOXY-COATED BAR

The use of epoxy-coated rebar is commonplace today for precast concrete applications in bridges and roadways, marine applications, parking structures, concrete repair and structures challenged with corrosion from deicing chemicals, continuous moisture exposure and/or salts. Kleinhaus said there are more than 65,000 reinforced concrete bridges with

epoxy-coated rebar nationwide.

“Based on survey results, epoxy coating is second only to increased concrete cover as a method to prevent reinforcement corrosion,” she said.

REFERENCES FOR PRECAST PRODUCERS

Precast concrete producers can obtain many valuable references and resource documents from CRSI in regard to the use of epoxy-coated rebar in precast products. The product guide titled, “Specialty & Corrosion-Resistant Steel Reinforcement” is an authoritative and comprehensive reference covering steel bars specified with improved corrosion resistance. The “Manual of Standard Practice” is another great resource for the precast industry, providing detailed information on steel reinforcement. **PI**

Phillip Cutler, P.E., is NPCA's director of quality assurance programs.

ENDNOTE:

¹ For additional historical information, visit epoxyinterestgroup.org and crsi.org.

REFERENCES:

- “Specialty & Corrosion-Resistant Steel Reinforcement” CRSI
- “Manual of Standard Practice” CRSI
- “Epoxy-Coated Reinforcing Steel Bars In Northern America” David McDonald, Managing Director, Epoxy Interest Group of CRSI
- ASTM A775, “Standard Specification for Epoxy-Coated Steel Reinforcing Bars”
- ASTM A934, “Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars”

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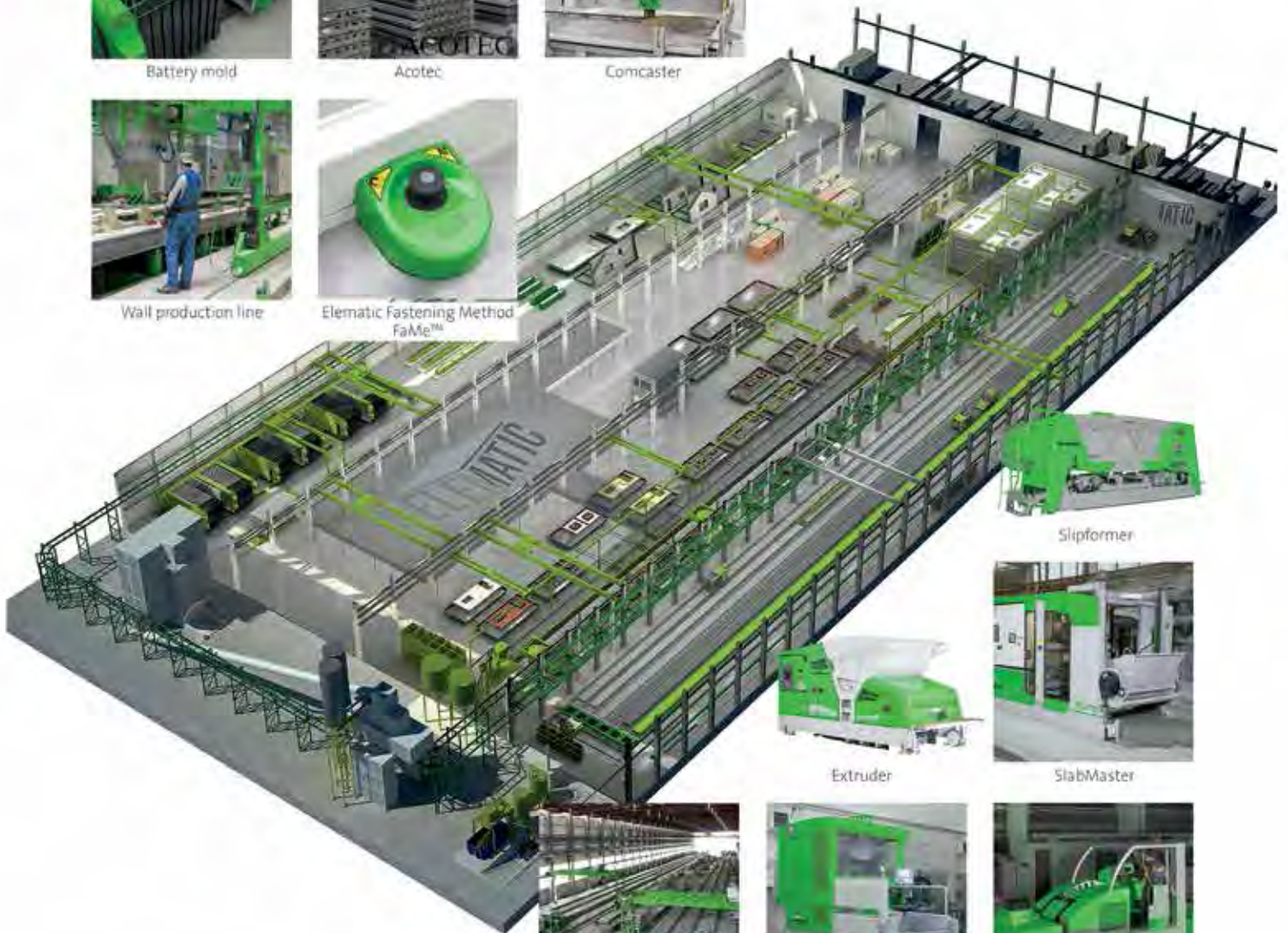
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PLACING AN EMPHASIS ON Safety

Safety has always been a top priority for NPCA, which is now reflected in the NPCA Strategic Plan.

By Evan Gurley

A **safe** work environment **maintains productivity** by keeping workers **on the job** and projects **on track**.

Investing in health and safety in the precast industry offers real benefits. Ensuring worker safety is clearly the most important. A safe work environment also maintains productivity by keeping workers on the job and projects on track. However, for a safety awareness culture to work, everyone needs to be on board, from chief executives to production employees. For this reason, the NPCA Board of Directors voted to add safety as Goal No. 5 of the NPCA Strategic Plan at the 2015 Annual Spring Board of Directors meeting. Safety, Health & Environment Committee liaison Jennifer Burkhart reported that, “The committee received very positive feedback from the Board for their initiative in developing the proposal and also for the formal recognition of a safety culture as inherent to our industry.”

GOAL NO. 5 IMPORTANCE

Why is the addition of Goal No. 5 important for NPCA members and the precast industry as a whole? As addressed in the SHE Committee’s proposal, “NPCA is the glue that binds the precast industry together and adds a level of consistency among precast member companies. NPCA provides best practices for all aspects of precast concrete production including marketing, quality control and business management. The SHE Committee feels safety and health are critically important to address on a national level, as safety affects all producer members.”

In addition, the SHE Committee pointed out that NPCA provides safety awareness in Production and Quality School courses, providing tools and best practices for workers to reduce potential injuries and accidents.

The proposal states, "The adoption of Goal No. 5 will increase the visibility in our association which will be marketable, visible and financially beneficial."

SHE Committee Chairman Don Graham said, "It is logical to give member companies tools to improve their safety and health programs and the potential financial benefits to member companies are significant. The addition of Goal No. 5 to the NPCA Strategic Plan is critically important in light of NPCA's leadership role in the precast concrete industry."

FINANCIAL IMPACT OF SAFETY

Injuries are very costly to precast producers in a number of ways. The monetary impact an injury has on a company is one that should cause alarm. According to OSHA's "Safety Pays" calculator, one strain on average can cost more than \$30,000. The hidden, indirect cost of an injury is more than double. If a back strain injury has a direct cost of \$33,528, you can expect the indirect cost to be upwards of \$36,880, with the combined cost totaling \$70,408. If a member company has a profit margin of 3%, they will have to sell an indirect \$2.34 million just to recoup the cost of this one injury.

GOAL NO. 5: WHAT'S INCLUDED?

The SHE Committee's adopted proposal includes the following action items:

- Present annual NPCA Safety Awards with special recognition to the Hall of Fame companies
- Provide education on the cost of injuries and their impact to the bottom line
- Establish best practices for qualified riggers and qualified signal persons
- Take ownership and input to the PQS safety offerings
- Deliver the unified message across the entire concrete industry that safety pays
- Develop and present four safety webinars a year

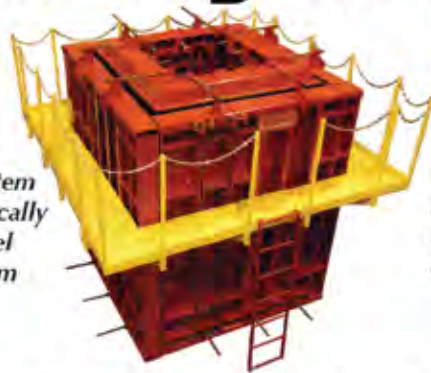
The addition of safety as Goal No. 5 aligns with NPCA's mission statement to provide industry leadership and will benefit the membership and precast industry moving forward. **PI**

Evan Gurley is a technical services engineer with NPCA.



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PRECAST IN Extreme Conditions

Precast concrete gives designers and project managers control in the face of many uncontrollable variables in extreme situations.

By Evan Gurley and Kirk Stelsel

It's not uncommon to hear a specifier say precast concrete is the best material for a job. But on certain projects there is no other product that comes close. Examples include custom jobs or situations where extreme circumstances come into play – sometimes both.

In the following examples, specifiers used precast concrete to mitigate risks to human life, high levels of traffic, major threats or harmful environments.



THE PERFECT STORM (SHELTER)

As evidenced by the devastation caused by major storms from coast to coast, resilient construction is rarely a priority and people and businesses suffer the consequences. The Institute for Business and Home Safety estimates 25% of small- to mid-sized businesses do not reopen following a major disaster.¹ The loss of life and commerce to a community is often catastrophic. Unfortunately, it often takes learning these hard lessons before an investment is made in a shelter or other resilient construction.

Numerous satisfied customers have sent thank you letters to Vaughn Concrete Products following installation of a precast concrete storm shelter.

Mike Vaughn, P.E., is the president and general manager of Vaughn Concrete Products headquartered in Henderson, Colo. His company manufactures a wide range of storm shelter products. Vaughn has heard from numerous customers who received thank you letters from employees following installation of a precast shelter, but there's one he'll never forget. After exhibiting at a garden show in Oklahoma City, Okla., he reached out to a local livestock auction to see about setting up his display there rather than hauling it back home.

"I told the guy I needed about 100 feet of space at his facilities to set up these shelters," Vaughn said. "He said, 'What are you going to pay me?' and I said, 'It's not about what I'm going to pay, it's about what you're doing for your people.'"

That didn't resonate, so the two agreed to a price. Two years later, a large tornado went right through the property.

"Nine of his people are alive only because of those storm shelters," Vaughn said. "He called about 10 days after that and was quite humbled and said he got calls from the families of eight of the nine employees telling him how much they appreciated him putting in that display so they had a place to go. On that phone call, he ordered a new shelter to be built right in the middle of his facilities."

Extreme weather events are just one example of the many situations in which the performance of precast concrete cannot be matched.

BIG RIG-RESISTANT WALLS

Champion Precast in Troy, Mo., makes a range of anti-terrorism and security products to impede everything from crowds to large vehicles. Its products are even used for training by the military. The company regularly supplies Fort Leonard Wood with different sizes of T and Alaska barrier products used during live-fire exercises to recreate scenarios soldiers will face overseas.

Bollards manufactured by Champion Precast sit outside the iconic Gateway Arch in St. Louis to obstruct vehicular traffic and protect pedestrians. Each is 8 feet, 3 inches tall with about 4 feet of that buried. The company casts the bollards with two chamfers and inserts so the customer could hang a large anchor chain between the bollards for looks.

"Precast concrete is a superior barrier material due to its great design flexibility and aesthetic compatibility with urban settings," said Jon Ohmes, production coordinator. "They can be used for everything from simple tasks such as crowd control or parking to uses such as securing a business to avoid terrorism."

One of the largest security projects the company has worked on is a security wall for a nuclear power plant. The company manufactured two rows of wall panels installed in an offset pattern that surround the plant. Each wall panel is 4 feet tall, 5 feet deep and 9 feet long. The company determined the length so it could ship two units per load. The panels have a double cage and while they are not architectural, the company poured them with self-consolidating concrete for aesthetics and finished them with a chamfered side.

To test the wall, the customer ran a fully-loaded semi into it. The test moved one wall enough to change the specification to add a second



Precast concrete bollards obstruct vehicular traffic and protect pedestrians in St. Louis, Mo.

row. A panel was also taken to a quarry for an explosives test. In this extreme condition, no other product could provide the security and longevity of a precast concrete wall.

DIMINISHING DETOURS

Sitting in traffic or enduring endless detours is painful. Thankfully, the precast industry has pioneered a modular solution for road construction. Precast concrete pavement allows owner agencies to balance accelerated construction and rapid renewal, structural capacity, durability, quality, geometry, aesthetic versatility and reduced life cycle costs.

Precast concrete pavement is starting to gain national attention. In 2014, four jobs in Southern California alone totaled nearly \$30 million. Caltrans bid a slab replacement project in Santa Barbara County on U.S. Route 101, one of the longest state highways in California. The highway

Precast concrete pavement panels allow for rapid repair and construction.





Photo courtesy of Pre-Con Products

Precast isolation casings protect the Schuyler Heim Bridge from the aggressive ocean environment, seismic loads and abrasion from passing vessels.

faces high traffic volume at all hours. U.S. 101 also happens to be part of a state-recognized safety corridor that acts as an emergency route for the military. The highway has only two lanes in each direction, so closing down more than one lane was out of the question and would require a major incident report by the state.

Pre-Con Products used 680 cubic yards of concrete to manufacture precast individual slab replacement panels. The panels are equal to the width of a lane and were placed directly on the graded base with voids filled by grout. Panel thickness criteria came from the existing pavement thickness, except when the existing thickness was less than the minimum threshold.

“The main reason for selecting precast pavement for this project was the need for a rapid construction,” said Mehdi Parvini, Caltrans senior pavement engineer. “The other concern for the project was a limited work zone. With precast pavement, the space required for the construction zone would be reduced.”

Parvini added that precast projects are ideal when there’s a limitation for road closure. Closing high-volume roads for long curing times is not practical. With precast pavement, the road is closed during a night shift and reopened in the morning.

Jason Kline, Caltrans resident engineer, said this was District 5’s first time using precast pavement for rehabilitation. And while Kline said there were some challenges, it worked as planned.

“District 5 will be pursuing using precast pavement for rehabilitation and repair projects in the future,” he said.

Pat Camp with Pre-Con Products has been manufacturing precast pavement for many years, and is extremely excited about the traction this product is gaining in Southern California and across the country.

“Precast concrete pavement, in my opinion, has the potential to be one of the biggest markets ever in the history of precast,” Camp said. “It really has the potential to be as big as anything precasters have ever seen.”

Camp emphasized that having good working relationships with Parvini, Kline and the contractor allowed for the project to be a success. He also stressed that doing extensive homework to make sure the product works in the field is essential.

“Since precast pavement is in its infant stage, any precast pavement project that goes wrong will give this technology a black eye and we can’t allow that as an industry,” he said.

With extreme levels of traffic, no product can minimize disruptions like precast concrete pavement.

PRECAST WAVE BLOCKERS

The Schuyler Heim Bridge, completed by the Navy in 1948, is one of three that connects Terminal Island to the mainland in Los Angeles County. It is named for Commodore Schuyler F. Heim, commanding officer of the Terminal Island Naval Base throughout World War II.

In 1994, it was determined the bridge was in need of seismic retrofit improvements, but replacing the bridge was more practical and cost-effective. The removal and replacement of the bridge and the construction of new on- and off-ramps using various precast concrete elements is making and breaking waves.

The \$210 million replacement project started in October 2011 and completion is estimated for early 2017. In addition to creating a new fixed-span bridge that meets current seismic standards, the project also adds 42 feet in width in the form of standard shoulders and a southbound auxiliary lane. The minimum vertical clearance of the bridge will be 46.9 feet over the mean high water level, allowing for accommodation of the new 45-foot fireboats.

“This is an exciting project to work on because of the complexities of constructing a project in water but also because of the Heim’s historic past and current importance to goods movement throughout the state and the country,” said Hammer Sui, Caltrans resident engineer. “We want to make sure that it remains a vital piece of infrastructure well into the future.”

Of all the bridge elements, the ones subject to some of the most extreme conditions are the precast concrete isolation casings. The casings protect the bridge columns from the aggressive ocean environment, seismic loads and abrasion from passing vessels. Precast isolation casings were selected by the designer on the project over steel casings as they are more durable and have superior impact and abrasive resistance.

Concrete has been used in seawater applications for decades with excellent

performance. However, special care in mix design and material selection is necessary. Warren Taylor, president of Pro-Cast Products Inc. located in Highland, Calif., said special provisions such as the use of epoxy-coated rebar, epoxy-coated bar couplers, galvanized ladder rungs and silica fume were all used in order to combat the aggressive corrosive environment. Using precast concrete, the isolation casings are able to resist weathering, chemical attack and abrasion while maintaining their engineering properties.

Pro-Cast manufactured 220 pieces to construct the 55 isolation casings. Heights of the casings varied from 13 feet to 25 feet and the heaviest precast piece was 20 tons. A good working relationship between the precaster, MCM Construction and the Caltrans engineers led to a successful installation of the precast components.

DEALING WITH EXTREMES

Precast concrete products protect humans, infrastructure and equipment from extreme environments on a daily basis. They also make projects in extreme conditions easier to manage. And it's in these situations that precast concrete products exhibit the breadth of their capabilities to designers and specifiers. **PI**

Evian Gurley is a technical services engineer with NPCA.

Kirk Stelsel is NPCA's director of communication and marketing.

ENDNOTE:

1 disastersafety.org/wp-content/uploads/open-for-business-english.pdf

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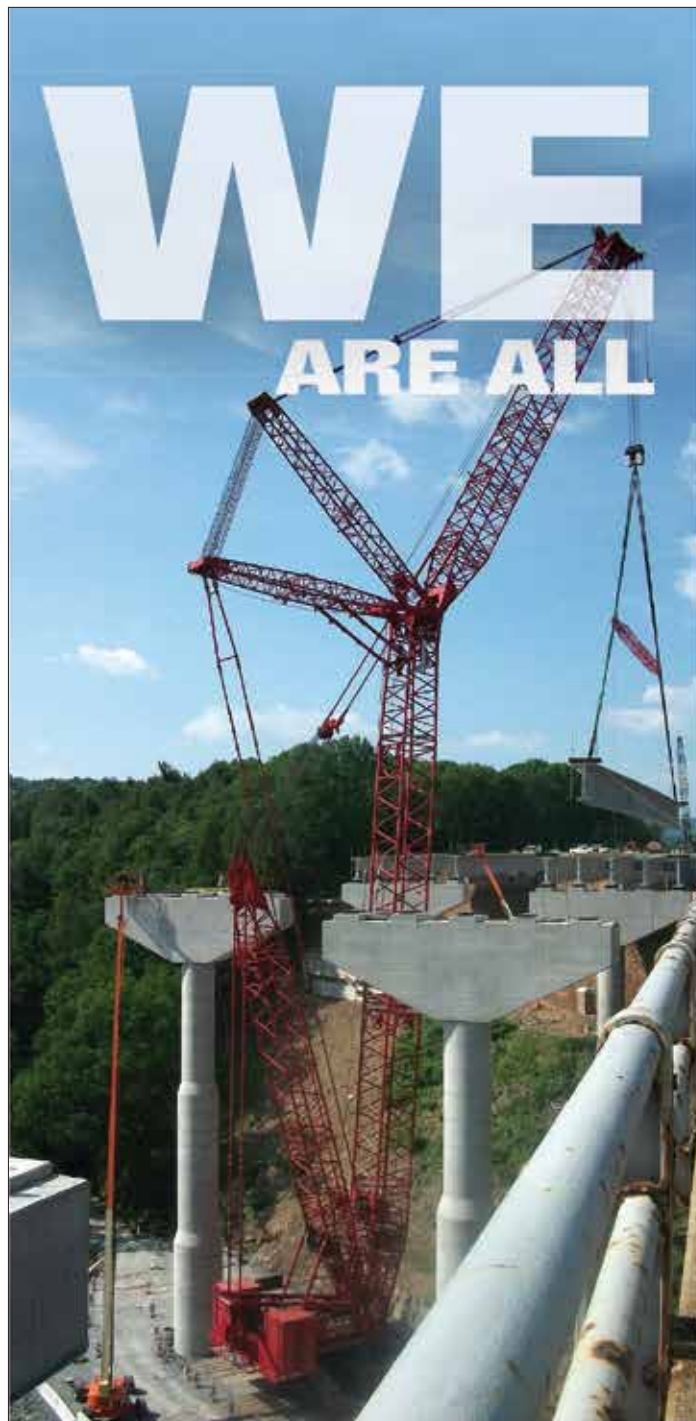
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MATERIAL MATTERS:

Fly Ash

Fly ash is used to improve the durability and quality of precast concrete products.

By Debbie Sniderman

EDITOR'S NOTE:

This is the third article in a four-part series on materials that enhance the performance of concrete. This segment covers fly ash. The last segment will cover accelerators.

Fly ash is the fine ash produced at coal-fired power plants that develops cementitious properties when mixed with cement and water.



Photo Credit: HW Handovers

Chances are you use fly ash at your plant or know a plant that does. But how much do you really know about where it comes from or why it works so well in your mix? Fly ash is a byproduct of burning coal during combustion at power plants and has been used as a cementitious material in

the United States on a large scale since 1948.

Fly ash is not technically cement but a pozzolan with particle sizes like cement. When mixed with water, it chemically reacts with calcium hydroxide to form compounds possessing cementitious properties. And, when added as part of the concrete cocktail, it provides

a number of well-known benefits to precast concrete producers, including being more economical and sustainable, slowing down the rate of corrosion and making precast more durable.

HOW FLY ASH WORKS IN CONCRETE

Fly ash increases concrete's durability by the pozzolanic reaction. The hydration reaction of water and cement produces calcium silicate hydrate and calcium hydroxide. When fly ash is introduced, it reacts with the CH, producing more CSH.

This is advantageous because CH doesn't benefit concrete and is often easily dissolvable, allowing chloride ions to enter. Anything that reduces the amount of CH in concrete helps improve durability and strength.

Also, concrete with more CSH has smaller sized pores. With reduced pore size distribution, concrete has lower permeability from outside agents such as chlorides. Chlorides typically enter through large pores and can travel several inches to react with rebar or other materials inside the concrete. With finer pore sizes, it's harder for chlorides to enter.

More CSH also substantially slows the ingress of sulfates into concrete by another mechanism different from permeability. If concrete walls or columns are used in soil that containing larger than usual amounts of sulfates, adding fly ash can reduce expansive reactions and cracking. In addition, when fly ash forms more CSH, it prevents the well-known alkali silica reaction from happening by trapping the alkalis in the concrete.

"The biggest change over the last 10-20 years is the more widespread use of subbituminous coal from the western part of the USA than the bituminous coal mined from parts of the country east of the Mississippi."

Tom Adams executive director, American Coal Association

WHAT'S IMPORTANT ABOUT FLY ASH

According to Tom Adams, executive director of American Coal Association, fly ash helps makes a more dense and less permeable concrete.

"This is important in the eye of the audience that precasters appeal to, as their customers are in it for the long term," Adams said. "For applications such as parking decks and other heavy precast work, long-term durability and maintenance are important concerns, and one of the most outstanding contributions of fly ash to quality."

The fly ash coming out of power plants today isn't significantly different from earlier decades, but the way it is used in the marketplace has evolved.

"Cement chemistry has changed over the last several decades," he said. "The grinding and chemistries have evolved to accommodate a number of concerns, including U.S. Environmental Protection Agency requirements. As cement has evolved, fly ash hasn't."

Class C fly ash, from subbituminous coal, has lower heat values, is more reactive and has much less sulfur content than Class F fly ash from bituminous coal. As more plants have shifted to subbituminous coal, it has made an impact on fly ash use.

"The biggest change over the last 10-20 years is the more widespread use of subbituminous coal from the western part of the USA than the bituminous coal mined from parts of the country east of the Mississippi," he said.

While there are many types of fly ash available, some are not suitable for use in concrete. ASTM C618 is the standard specification for coal fly ash and raw or calcined natural pozzolan for use in concrete. It defines the specifications and class limits. Both Class C and Class F fly ash have to comply.

Adams said precasters need to know which type to use when mixing concrete for a specific application. Most Class C fly ash will set much quicker than Class F, and it doesn't take a lot of adjustment in chemistry to manage.

"Marketers have to inform customers where the fly ash is from, because it behaves

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“Fly ash generally costs less than Portland cement depending on the market and delivery logistics. Even when using additional admixtures to get it to set in an acceptable way, fly ash still offers a lower cost concrete.”

–Tom Adams
executive director, American Coal Association

differently from different parts of the country. Some are a blend of western and eastern coal,” he said. “Precasters need to be aware of the different types because they react differently.”

WHY FLY ASH IS IMPORTANT TO USE

The big bang for using fly ash is in improving durability. Decades of evidence shows that fly ash improves durability and compressive and flexural strengths, and it is the best way to deal with the ASR problem. Adams said that departments of transportation in the U.S. spend more than \$5 billion per year on fly ash, as it’s one of the many tools that allow structures to be built to last 75-100 years.

“Fly ash generally costs less than Portland cement depending on the market and delivery logistics,” Adams said. “Even when using additional admixtures to get it to set in an acceptable way, fly ash still offers a lower cost concrete.”

In addition to cost savings, increased fly ash in a concrete mix provides sustainability benefits. Fly ash is a big help for those that are producing for clients who care about recycling or reusing materials that would have otherwise be landfilled. Every ton of fly ash used instead of Portland

cement keeps it out of a landfill and cement in concrete, thus reducing carbon from carbon dioxide emissions.

HOW FLY ASH ADVANCES A PRECASTER’S WORK IN THE PLANT

Fly ash is commonly specified in precast jobs, reducing surface imperfections and improving workability. Reducing the water-cementitious material ratio allows a precaster to increase the fly ash content and increase the early-age strength. Chemical admixtures are also used as an affordable way to offset the effect of fly ash, helping the concrete quickly achieve strength. **PI**

Debbie Sniderman is an engineer and CEO of VI Ventures LLC, an engineering consulting company.

REFERENCES:

- ASTM C618, “Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete,” astm.org/Standards/C618.htm
- American Coal Ash Association, aca-usa.org
- Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete, astm.org/Standards/C311.htm

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Implementing Email Usage Policies IN THE WORKPLACE

If you're not already using an established email usage policy, now is the time to develop one.

By Bridget McCrea

By their very nature, the best managers tend to be nurturing, communicative, interactive types known for their ability to bring out the best in their teams. To achieve this, managers must know how to communicate well, delegate authority to capable team members, round out their teams with good candidates and manage their own calendars. Unfortunately, Murphy's Law can quickly come into play on any given day when the game of "putting out fires" impacts a manager's ability to effectively do his or her job.

These days, news headlines are filled with reports of politicians, company leaders, and employees who have improperly used email, social media, and other web communication tools while at work. Look no further than Hillary Clinton's use of a personal email account as Secretary of State for an example of this even at the highest levels of government.

Your email usage policies may not make headlines, but having those policies in place – and ensuring that employees understand and adhere to them – is important in today's technology-centric world. Be it to protect the company from the sharing of trade secrets or proprietary information, safeguard employees or customers from harassment, or to ensure workers aren't using workplace email accounts for personal/private matters, a good email usage policy is a necessity.

"Ignore this step and you can put your company at risk," said

Anne P. Mitchell, an attorney and CEO/president of ISIPP SuretyMail Email Reputation, Accreditation & Certification in Boulder, Colo. "The good news is that it's not difficult to do, and the issues that can put your company at risk are fairly easy to address."

LAYING DOWN THE LAW

When Shea Concrete Products of Amesbury, Mass., hires a new employee or promotes a current worker to a new position, it takes time to review its employee handbook with that person. Included in that handbook are the firm's policies concerning the protection of customer credit/payment information, the backing up of computers and data, and the use of email while in the workplace. And while the latter doesn't dive quite as deeply as Shea's Manager Greg Stratis would like, he said the policies do spell out the company's acceptable use policies for email.

"We focus on the fact that our email system can't be used for personal/private use," said Stratis. "That point is clearly conveyed in our employee manual, which also discusses

"If you're letting an employee go, you'll want to change all of his or her administrative passwords, email passwords or other access options before you even sit down to deliver the news."

– Anne P. Mitchell, *SuretyMail Email Reputation, Accreditation & Certification*


Are You Following the SPAM Rules?

The CAN-SPAM Act of 2003, signed by President George W. Bush in 2003, established the United States' first national standards for sending commercial email and requires the Federal Trade Commission to enforce its provisions. In 10 Things You Need to Know About CAN-SPAM, ISIPP SuretyMail Email Reputation & Certification outlines the top issues that companies need to be thinking about when sending out commercial email. They are:

1. CAN-SPAM applies only to commercial email.
2. CAN-SPAM applies to email for which a primary purpose is to feature your goods, services, or content even if you do not send the email yourself.
3. CAN-SPAM does not apply to third-party advertisers who advertise in your mailings so long as it is clear that the mailing is coming from you and not them.
4. CAN-SPAM liability can attach to email sent out by your affiliates on your behalf; however
5. CAN-SPAM liability will not attach to email sent out by your affiliates on your behalf unless you know, or should have known, that the email is being sent in violation of CAN-SPAM and you stand to gain from it financially and don't try to stop it.

While state and local governments certify some crane operators, the vast majority of operators who become certified do so using a third-party testing organization accredited by a nationally recognized accrediting organization. This is the only certification option that is "portable," meaning that any employer who employs an operator may rely on the operator's certification as evidence of compliance with the standard's operator certification requirement.

NPCA is working with nationally accredited organizations to ensure members have all the needed information and will continue to monitor the OSHA crane and derricks standard to provide updates.

 A full list of rules is available at isipp.com/ten-things.pdf

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the fact that company email can be monitored by us at any time.”

In fact, Stratis said he’s had to monitor worker email in the past, although he said nothing major came out of the exercise. For the most part, he said that oversight took place due to customer-related issues, and because some workers weren’t using proper email etiquette – ending emails politely, not using all caps in the messages and so forth.

According to Stratis, email usage policies fall under one of the precaster’s primary policies, which is spelled out in its employee handbook as: “It is extremely important that we all use good business judgment.” He said the company hasn’t run into any issues regarding confidentiality or the release of any proprietary information via email.

“I’m sure we could be doing more in this area, but so far our approach has worked out well for us,” Stratis said.

“If you do have authorized social media accounts for your company, be sure to include good usage policies around those accounts as well.”

– Susan Bassford Wilson, *Constangy, Brooks, Smith & Prophete, LLP*

CUTTING UP THE PASSWORDS

Along with good email policies, Mitchell also advises precasters to use “employee exit” rules that take into account a worker may have access to internal files on a password-protected server.

“If you’re letting an employee go, you’ll want to change all of his or her administrative passwords, email passwords or other access options before you even sit down to deliver the news,” said Mitchell. “These days, it’s extremely easy for someone who has access to a computer system or company email to destroy or steal company information with just a few keystrokes.”

And while we all want to believe the best in everyone, the fact is that disgruntled ex-employees can wreak havoc on a company’s computers and even its very livelihood.

“A lot of companies don’t really think that way, or it doesn’t occur to them that someone might do that,” Mitchell warns. “But in the heat of the moment, someone who might otherwise be very rational might just go in and delete a whole bunch of really critical files or grab them and release them on the Internet. It’s much easier to create mischief and mayhem now with how connected everything and everyone is.”

ESTABLISHING GOOD RULES

When implementing email usage policies for the workplace, Susan Bassford Wilson, an attorney and e-Law Practice Group co-chair at Constangy, Brooks, Smith & Prophete, LLP, in St. Louis, Mo., said precasters should look carefully at their “exposure” levels.

“While it may be hard to justify the budget to revise or create a handbook and/or proactive policies, the bottom line is that investing proactively in policies can positively impact your

bottom line,” Wilson said. “Put simply, it’s much cheaper to invest in a well-drafted handbook that addresses some of these common issues than it is to litigate.”


As a starting point, Wilson said an attorney who has experience with workplace/human resources law can lend a hand in crafting policies concerning email usage in the workplace. When developing those policies, she said precasters should create one that addresses management/leadership and another for plant and office workers.

“This is important because the actions of your management employees can actually have a different binding effect on the company than the actions of a non-managerial employee,” Wilson said.

3 Ways to Control Emails at Work


It’s easy to get overwhelmed by email while you’re at work. Important projects are often put aside in favor of answering email every few minutes. Mike Strum, a manager at an industrial distributor in the Midwest and Jason Parks, owner of The Media Captain, share their tips for keeping email under control during the day:


- 1. Don’t use your work email for personal email.** “The problem this creates is twofold,” said Strum. “First, it floods inboxes with all sorts of distracting email, where email can be overwhelming enough already. Secondly, it makes it more difficult for coworkers monitoring or backing up inboxes when there are a slew of non-business emails to sift through.”
- 2. Limit internal emails.** Email is a great tool for documenting and helping keep track of communications with customers, suppliers and other external entities. However, using email as an internal conversation medium merely multiplies emails. For companies with server space concerns, this can be a big contributor to the space scarcity problem. “Go stop by someone’s desk,” Strum suggests, “or have a short meeting to hammer things out.”
- 3. Check email just three times a day.** If your inbox is flooded with messages, you can spend your entire workday in front of a computer screen responding to emails and not actually getting work accomplished. “By designating three specific times throughout the day, this will drastically improve productivity,” said Parks. “I recommend checking your email first thing in the morning, one hour after lunch and 30-minutes before leaving the office.” If you are not organized in responding to emails, you will either waste time or have bad email response habits that will be frowned upon within your workspace.




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Once a policy is drafted, Wilson strongly urges precasters to train their management employees on the related rules and requirements. And finally, she said precasters should factor in their individual challenges, needs and requirements when creating their policies – to ensure that the verbiage effectively addresses those issues. Different companies have different needs when it comes to email and technology. In a manufacturing facility, for example, only 10 to 25% of

“Email retention really is a critical part of any firm’s written email policy.”

– Anne P. Mitchell, *SuretyMail Email Reputation, Accreditation & Certification*

employees may even have a company email account.

And don’t forget to include social media rules under the umbrella, said Wilson, since many firms are now using Facebook, Twitter and other platforms for both internal and external communications.

“If you do have authorized social media accounts for your company, be sure to include good usage policies around those accounts as well,” said Wilson. “The key is to be as thorough and defined as possible in order to ward off any potential issues in this area.”

WHY RETAINING EMAIL IS IMPORTANT

Email retention is yet another aspect of a company’s good electronic communication usage policy.

“This is something that I can’t impress upon companies enough,” said Mitchell. “Email retention really is a critical part of any firm’s written email policy and it should basically say that any message that comes into the system should be saved for X number of days or months, retained forever or some other measure. It doesn’t matter what the specific policy is, but it does matter that you have a policy.”

Ultimately, Wilson said precasters that take the time to set up straightforward email usage policies for the workplace will have a leg up if and when issues arise.

“If something comes up, there can be no question later on as to whether the employee did something [wrong], because you had a policy clearly setting your expectations,” Wilson said. “Having a policy also makes it easier to discipline an employee and ensure that the same situation doesn’t happen again.” **PI**

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



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Duty, Honor, Country

A CITY'S TRIBUTE

Wieser Concrete Products manufactures precast kiosks and signage to honor an Illinois town's war veterans.

By Sara Geer

photos by Scott Evers Photography

EDITOR'S NOTE: Starting in early June, NPCA held its annual Readers' Choice Cover Contest seeking projects to be considered for the feature article in *Precast Inc.* Voting was open to all NPCA members. After a close competition, the most votes went to Wieser Concrete's plant in Roxana, Ill. The feature article is followed by short descriptions of all other contest entries.

WINNER

VETERANS MEMORIAL

PRECASTER: Wieser Concrete Products

PROJECT: Memorial Path

LOCATION: *Highland, Ill.*





Veterans are honored on 37 light poles placed along the path in Dennis H. Rinderer Park.

Outdoor walking and biking paths create a host of benefits for a community, including opportunities for exercise and healthy living. The city of Highland, Ill., is taking its newly built path one step further to provide an emotional, heartwarming journey.

A walk to remember

According to Highland City Manager Mark Latham, the path runs parallel to the city's newest road, Veterans Honor Parkway, on the northeast side of the town. The path is part of Dennis H. Rinderer Park, where two new precast concrete signs stand tall, welcoming visitors. In addition to the signs, precast concrete kiosks add an important element as they honor four local veterans who paid the ultimate price in service to their country – two in Vietnam, one in Afghanistan and one while training in California. The fifth kiosk honors Dennis Rinderer, who assisted the city in purchasing all the property for the project. A special bronze plaque sits on top of each kiosk with a beautiful remembrance designed by the veteran's families and architect Oates Associates.

Walking along the path, park visitors will not only fill their lungs with fresh air, but also their hearts as they read about the local war veterans who bravely fought to protect the United States. Veterans are also honored on banners attached to 37 light poles placed along the path. The city's plan has been 25 years in the making. Without the help of precast concrete, a special Memorial Day dedication would not have happened.

The same general contractor who helped to extend the city's new roadway was hired to organize the project. Keller Construction originally planned to construct the kiosks and park signage with cast-in-place concrete, but in order to meet the city's quick deadline, precast was a better option. As a regular precast concrete supplier for Keller Construction, Wieser Concrete Products was contacted about the job.

"We use precast quite often in many different capacities," said Tom Lavelle, project manager at Keller Construction. "On many projects, we utilize precast because it is cost effective while either helping to maintain or at times accelerating the construction schedule."

A memorial takes shape

Drew Wieser, general manager at Wieser Concrete in Roxana, Ill., said normally he wouldn't have taken on the project since it had an architectural design, but agreed since the contractor directly contacted them to help. Wieser said the project's biggest hurdle was building a form that permitted a curved shape but was still affordable and efficient.

"We worked with Universal Precast to design a foam mold that allowed us to cast the kiosk's in one piece rather than a base with attached walls," said Wieser. "So, we poured it upside down and kept the finished side on the bottom. We just had to roll the piece over after we cast it."

Wieser said the foam form worked well since it wasn't meant to be permanent, but that it lasted for five

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Two precast concrete signs welcome visitors to Dennis H. Rinderer Park.



good pours. It gave the product a smooth finish, allowing for easier installation of the stone veneer and bronze plaque. A 6,000-psi, self-consolidating concrete mix design was used

to pour each piece and No. 4 rebar was set at 12 inches for extra reinforcement.

"Everything needed to be precise" Wieser said. "If we built more of a custom wood form, it would be more difficult to build and you'd have to rebuild it after each pour. Some projects you need a steel form that lasts a lifetime and other times you use a form once. The material used has a big effect on the finish and your efficiency."

One piece was cast per day, taking the company a week to make all five kiosks. Although the project had been designed for cast-in-place concrete, no changes had to be made to the original project drawings since the form permitted the same design and rebar layout without adding construction joints, Wieser said.

"The form design made it just like pouring something flat," he added. "The reinforcing was a little more difficult because we had to bend it to the correct radius."

Once manufacturing was complete, Wieser Concrete delivered the pieces directly to the park and installed them. Lastly, a small foundation base was poured and a local stonemason attached the stone veneer to finish the project. The final product turned out exactly as the contractor and

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city intended and was within the original budget, he said.

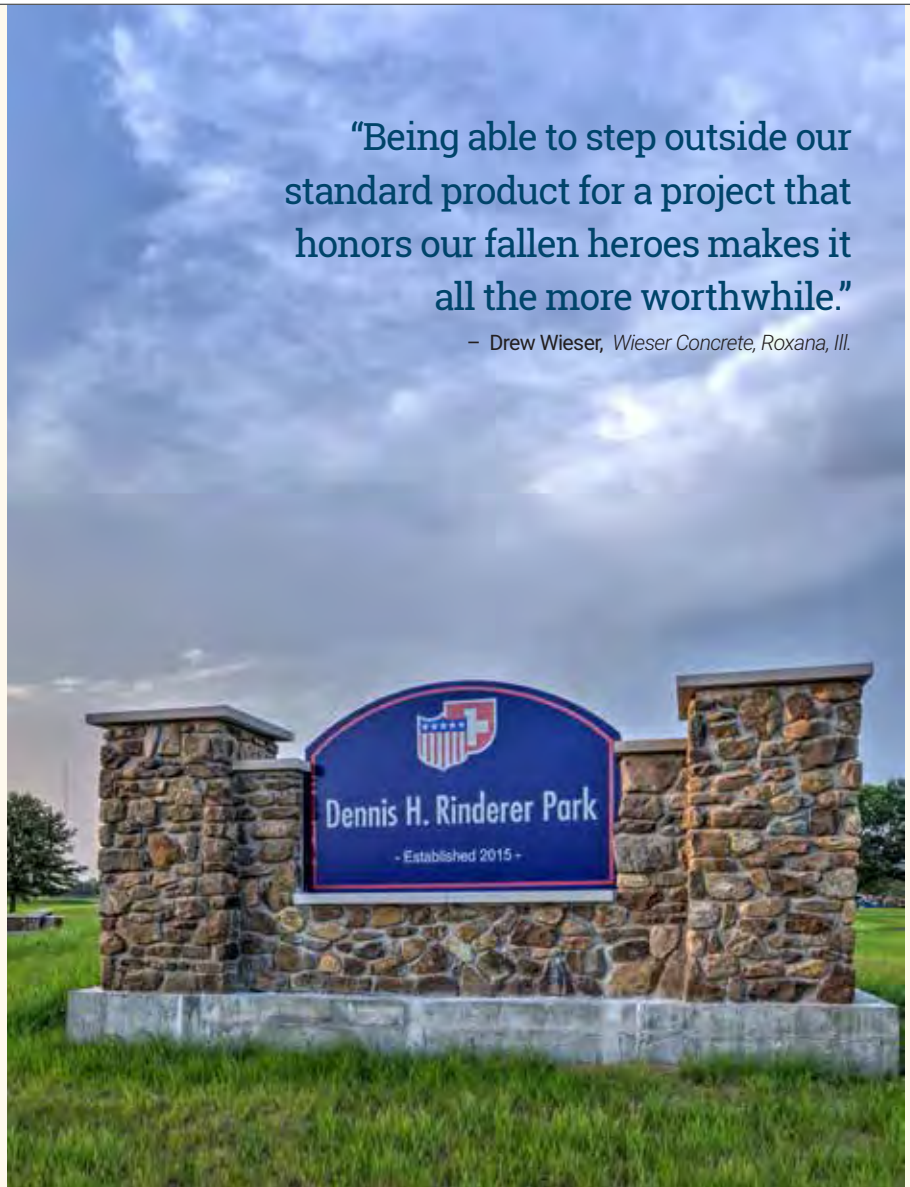
“This type of product is not something we are accustomed to, but it all went to plan,” Wieser said. “Being able to step outside our standard product for a project that honors our fallen heroes makes it all the more worthwhile.”

History forever cast in precast concrete

Latham appreciated the quick turnaround on the project that precast concrete offered. He said the installation went smoothly since each piece was already mostly finished before being placed in the park. The city also was able to hold its special Memorial Day presentation to celebrate the project’s completion. He said the city plans to one day offer a brochure-led walk along the path, allowing park visitors to identify the war veterans pictured in the banners and read about each of the heroes. The precast concrete kiosks will only enhance the experience more, he said.

“You have to come and take a look at it yourself to get a good impression,” Latham said. “It allows a biker or walker to stop, sit and read a really nice bronze plaque about the honored veteran, which is really nice. It’ll be there forever and I know the families were ecstatic.” **PI**

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



“Being able to step outside our standard product for a project that honors our fallen heroes makes it all the more worthwhile.”

– Drew Wieser, *Wieser Concrete, Roxana, Ill.*



Other Contest Entries

(in alphabetical order by company name)

PRECASTER: Arto Brick

PROJECT: Moroccan Flair

LOCATION: Indio, Calif.

A California homeowner’s Moroccan-style desert home comes to life thanks to blue Arabesque precast concrete wall tiles that flow from room to room.

Arto Brick manufactured 4,000 concrete tiles in one month to complete the project. Because blue is not a common color in the company’s line of work, it made the project unique.

Word of mouth led the owner to Arto Brick. The project was a collaboration between the owner’s dealer and project owner.



PRECASTER: C.R. Barger & Sons

PROJECT: Great Smoky Mountain Precast

LOCATION: Gatlinburg, Tenn.

A Stone Strong precast concrete wall by C.R. Barger & Sons is the star of the show on a 1.65-mile stretch of road in the Great Smoky Mountains.

The overall project will take a team of engineers, designers and contractors seven years to complete as it includes blasting, excavating and grading; concrete; and the construction of bridges and retaining walls.

Robert Saunders, engineer and designer, specified Stone Strong Systems' precast wall solution. The 14 precast concrete walls will span 80,000 linear feet and rise up to 70 feet

high. According to Barger & Sons, Saunders said the wall system was extremely versatile and fit well with the site's steep terrain and varied wall height requirements. Additionally, Thomas Meador, assistant district manager at Lane Construction Corp. in Salisbury, N.C., noted installation of the precast walls was "fairly easy" since each block fit with the next like a puzzle.

To maintain the region's beautiful, natural topography, laser scanning was used to produce a liner that replicates the existing stone of the area. Barger & Sons spent many months pouring 24 of the 28-square-foot blocks every day and is nearly finished with its part. The total project is slated to finish in 2017.



Photo courtesy of C.R. Barger & Sons



Photo courtesy of Concrete Systems Inc.

PRECASTER: Concrete Systems Inc.

PROJECT: Precast Bridge Railing

LOCATION: Quincy and Weymouth, Mass.

The reconstruction of the Fore River Bridge, which connects the Massachusetts cities of Weymouth and Quincy, has been 15 years in the making, but construction is finally underway. Precast concrete plays a unique role on this project, with precast railing both keeping travelers safe and adding to the aesthetics of the bridge.

The railing was originally bid as cast-in-place, which is typical for bridge railing in the state. Concrete Systems Inc. converted the job and poured the product using special forms. The forms allowed the rail to follow the grade on each end of the bridge and included adjustability to allow for openings to remain vertical to the changing grade. The precast solution saved the contractor time and money.

The bridge is part of Massachusetts Department of Transportation's accelerated bridge program. The program aims to reduce the number of structurally deficient bridges across the state and prevent others from falling into that classification.

PRECASTER: Gainey's Concrete Products

PROJECT: Precast on the Mississippi River

LOCATION: Harvey, La.

A custom precast concrete breasting dolphin, which assists in vessel berthing, now resides on the mighty Mississippi River.

The project took Gainey's Concrete Products two days of setup prior to pouring of the three decks. From initial setup to mold removal, it took three days to complete each deck. One of the biggest challenges for the company was casting an 8-foot-by-2-inch thick steel plate. Nelson studs were placed 9 inches apart from each other throughout the plate and pipe was placed in a specific pattern. The pipe had to be cast flush with the top of the concrete and the pattern was rotated to a specific angle in reference to the deck. The steel plate was required to protrude inches from the bottom of the concrete with only studs cast into the concrete.

A subfloor was created out of plywood with a hole cut out to allow the steel plate to sit below the bottom of the mold. Caulk then ensured concrete did not leak below the subfloor.

The design changed multiple times throughout the project, causing the company to change drawings and rethink fabrication methods for each change. In the end, the project was accurately fabricated within the required timeline.



Photo courtesy of Gainey's Concrete Products

PRECASTER: Kistner Concrete Products

PROJECT: Precast Arch Bridge

LOCATION: Binghamton, N.Y.

In the heart of Binghamton, N.Y., a new precast concrete arch bridge comprised of 60-foot segments replaced a steel girder and cast-in-place system.

Each of the 52 arch sections weigh 31 tons and are 4 feet in width with a 14-foot rise. The units were manufactured by Kistner Concrete Products with an SCC mix design and steam cured. The project also included a three-piece fascia.

The precast concrete arch segments were set in three phases, with each phase beginning late morning and completed by early morning the following day. Kistner noted that due to the superior manufacturing conditions of precast, the segments will allow for a long lifespan and a lower long-term cost. Additionally, the precast segments required significantly less construction time than alternative materials and thus saved the owner time and money. In addition, the arch shape sheds water naturally to eliminate any potential ponding.



Photo courtesy of Piedmont Precast

PRECASTER: Piedmont Precast

PROJECT: From Rot to Resilience

LOCATION: Roswell, Ga.

Precast concrete seawalls now add a unique aesthetic for Martin's Landing, a planned community nestled alongside the Chattahoochee River, in Roswell, Ga.

All lakes, greenbelts and amenities in the community are managed and maintained by the Martin's Landing Foundation, a non-profit corporation consisting of all Martin's Landing property owners. When the

foundation needed to replace the rotting wood retaining walls surrounding its 55-acre lake, it contacted Piedmont Precast to use the Redi-Rock gravity wall system.

This project features 14 gravity seawalls totaling 25,000 square feet. The gravity wall design was able to limit the excavation needed for installing the walls. The foundation decided to use the more cost-effective Cobblestone units below the lake level, while choosing the superior aesthetic of the Redi-Rock LedgeStone above the water.



Photo courtesy of Kistner Concrete Products

PRECASTER: Smith-Midland Corp.

PROJECT: Award-Winning Precast

LOCATION: Annapolis, Md.

The Association of General Contractors awarded Smith-Midland Corp. first place for an architectural precast project at 410-420-430 National Business Park complex in Annapolis, Md.

NBP is a 375-acre, 2.3 million-square-foot development owned by the National Security Agency's numerous high-tech and high-profile contractors. The company previously manufactured the architectural precast panels for the 140 and 220 NBP projects. The three office buildings are LEED Gold certified and consist of two 4-story, 120,000 square-foot buildings and one 5-story, 140,000 square-foot building, clad with more than 71,000 square feet of buff-colored, heavy-sandblast architectural precast panels.

Smith-Midland was chosen because of the cost and time savings, durability, flexibility and aesthetic options attributed to the use of its precast concrete panels. Delivery and installation for the two 4-story buildings began in August 2012 and were completed in spring 2013. Final completion of the full complex was in early fall 2014. NBP was the fifth precast concrete panel project Smith-Midland finished for the owner, Corporate Office Properties Trust. According to the precaster, COPT has been pleased with the results and continues to specify its precast for new building projects.



Photo courtesy of Smith-Midland Corp.



Photo courtesy of Speed Fab-Crete

PRECASTER: Speed Fab-Crete

PROJECT: Uplifting Wall Panels

LOCATION: Irving, Texas

Davis Crane Services, a supplier of cranes and crane rentals, chose Speed Fab-Crete as design-builders for its new corporate headquarters in Irving, Texas.

The company manufactured structural precast concrete wall panels with a durable, attractive coating; metal accents; and applied stone veneer to give the building a sleek, modern appearance. "Eyebrow" canopies shield the windows from the harsh Texas sun and give a lively play of shadow to the building.

The patriarch of the Davis Crane family enjoys showing off the new building and Speed Fab-Crete often takes prospective clients for tours. A grand opening was held December 2014.

PRECASTER: StructureCast

PROJECT: Ingenious Precast Restroom

LOCATION: La Jolla, Calif.

The installation of a restroom at Black Beach in La Jolla, Calif., illustrates the ingenuity only precast concrete can provide.

The project, commissioned by University of California San Diego Alumni and manufactured by StructureCast, at first proved to be challenging. The property suggested for the restroom is owned by the university, but is also coastal waterfront and the site of a Native American burial ground. No water or digging were allowed, so a vault could not be installed underneath the restroom.

With this in mind, StructureCast designed the restroom with vault seats inside. Water tanks were also installed inside each room to work with the stainless steel sinks, allowing hand washing. Solar panels operate the electric door locks and LED lighting.

StructureCast said the project's architect was instrumental in obtaining Coastal Commission approvals and coordinating the color pallet to fit into the surrounding area. P1



Photo courtesy of StructureCast

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TAKING SUSTAINABILITY **Below the Surface**

By Claude Goguen, PE., LEED AP

When we talk about sustainability in the construction industry, there is a tendency to focus on buildings and above-ground structures. When we hear about LEED projects, we imagine elaborately designed buildings that harvest rainwater through grassy rooftops. However, we need to shine the green spotlight on the unseen workhorses of the precast concrete industry – the underground structures – as well.

MARKETING SUSTAINABILITY

Marketing a product requires you to first identify values and strengths. You know you make a strong and durable product. But can you talk about its sustainable properties? Twenty years ago, those attributes would not be worth mentioning, but oh how the world has changed. Whether you sell to homeowners, contractors, developers or engineers, chances are good you will come across someone who values sustainability and will base their decision partially on that criteria. They may simply ask how you make a sustainable product or go even further and ask for proof in the form of an Environmental Product Declaration. Michael Tidwell, president of Bartow Precast in Cartersville, Ga., recently reported that a customer asked for an EPD

for a grease interceptor project in Florida. This is a glaring example of things to come.

Whether you make pipe or panels, manholes or modular buildings, tanks or T-beams, you will likely face this situation, and being prepared may give you an edge over your competitors.

HOW ARE UNDERGROUND PRODUCTS SUSTAINABLE?

You may already be using materials and products that are inherently sustainable. For example, the use of fly ash or slag reduces the amount of energy required to make a product simply by reducing the cement content. It also diverts materials otherwise bound for landfills to your product. Fly ash and slag are also proven to enhance the hardened properties of a product, which makes it more durable.

The reinforcement used in precast concrete structures is typically made of 90% to 100% recycled steel. Raw materials for precast underground structures – cement, water and aggregates – are extracted and manufactured locally, thereby reducing environmental impacts associated with transporting products to distant plants. Locally manufactured structures also benefit the local economy, which is often overlooked.

Looking at performance, precast concrete has a proven track record of durability. According to the U.S. Army Corps of Engineers Manual 1110-2-2902 – Section 1-4 Life Cycle Design, “Most studies estimated product service life for concrete pipe to be between 70 and 100 years. Of nine state highway departments, three listed the life as 100 years, five states stated between 70 and 100 years, and one state gave 50 years.” These structures must endure significant loads and stresses while withstanding extreme interior environmental conditions. A long life cycle is a core sustainable attribute.¹

Precast concrete underground structures require minimal to no maintenance and do not burn, rust or rot. They can also be recycled at end of use. The following is a more detailed look at specific sustainable attributes for pipe, manholes, wastewater tanks, stormwater treatment structures and utility structures:

LEED

The current LEED version 2009 recognizes many advantages of precast concrete underground structures. National Precast Concrete Association members can use the new and improved LEED calculator to provide data to customers that enables them to qualify for additional credits. The calculator is found at precast.org/sustainability/leed-calculator. The LEED 2009 reference guide contains a complete listing of credits that benefit from precast concrete structures. View it at precast.org/sustainability.

LEED v4 is scheduled to roll out in October 2016. There are significant changes to the system; however, precast concrete underground structures can still help with credits. Please read the Precast Inc. Jan.-Feb., 2014 article on LEED v4 for more information at precast.org/2014/01/leed-v4/.



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Underground precast concrete products such as pipe, manholes, storm line junction boxes and utility structures are durable, resilient and require minimal maintenance giving them an advantage over alternative materials.



Pipe

Concrete pipe is synonymous with durability, longevity and resiliency – giving it an advantage over alternative materials. The energy used, emissions released and traffic congestion caused during construction to maintain and replace pipe is significant. Many times, months or years of infiltration or exfiltration will precede required service on these alternative material pipes, and that can also result in serious damage to the local ecosystem. However, concrete pipe is usually backfilled with native soil and does not require imported material.

Manholes

Precast concrete manholes are designed and built to withstand many extreme loads including traffic, soils and water. Similar to pipe, precast manholes are durable, resilient,

require less maintenance and lower the environmental impact of construction and traffic disruptions. Manholes are modular, manufactured to meet specific needs and install easier and faster. Less time installing decreases emissions from machinery. Precast concrete manholes have watertight joints and connections to keep harmful, untreated wastewater from getting out.

Wastewater tanks

Decentralized wastewater treatment is increasing in North America. Centralized sewer systems are already beyond their limits, can't support additional loading and require a lot of energy to run. For this reason, structures used in wastewater treatment must be reliable and effective as well as sustainable. Diverting wastewater from sewers

Envision Sustainability Program

The American Society of Civil Engineers has a very strong sustainability program which includes a rating system called **Envision**. This system is aimed at infrastructure projects that are more apt to have underground products for drainage and treatment. Envision measures sustainability of an infrastructure project from design through construction and maintenance. Precast concrete structures have many benefits to offer in this program. **Visit sustainableinfrastructure.org for more information.**

is already a sustainable milestone. Treating stormwater and wastewater on site is becoming more important as the green building movement gains momentum. Precast tanks withstand significant loads due to traffic and soils and are designed and manufactured to provide a long service life. Tanks manufactured with alternative materials that face strength or buoyancy issues lead to more construction and pollution. Precast tanks can be customized to meet specific needs for advanced treatment or other site conditions resulting once again in faster installation and less impact.

Stormwater treatment structures

Treatment of stormwater prior to releasing harmful elements to sewer systems is key to sustainability. Precast stormwater treatment structures are modular and can fit any design situation. Precast stormwater management components are watertight, resilient during storage and transportation, easy to install, less vulnerable to damage during backfill and environmentally safe during operation.

Utility structures

Precast concrete utility structures are ideal for communications, electrical, gas or steam systems since they protect vital connections and controls for utility distribution. Precast structures can be manufactured to fit any design situation, requiring less time on site performing modifications. Precast concrete utility structures are noncombustible, can withstand high temperatures. They are also nontoxic, environmentally safe and have a long life cycle. Precast structures are installed much quicker than cast-in-place alternatives reducing site impacts and pollution.

USE SUSTAINABILITY TO YOUR ADVANTAGE

Underground structure manufacturers have no excuse for not using sustainability in their marketing. Sustainability applies to the entire job site from the pipe to the carpeting. Competing materials are recognizing the importance of sustainability. Recently, an environmental study surfaced that was commissioned by plastic tank manufacturers making the claim that plastic structures have significantly less impact than precast concrete. These companies are seeing greener pastures ahead.

The good news is your product already has inherent sustainable attributes, whether you know it or not. You may be able to implement some new practices to make them even more sustainable. Retaining and growing your market share could depend on your ability to recognize how green your product is and how much greener it can be. **PI**

Claude Goguen, PE., LEED AP, is NPCA's director of sustainability and technical education.

REFERENCES:

- 1 A life cycle assessment is a scientific method of evaluating the environmental impacts of a product over its full life, including raw material acquisition, manufacturing use and disposal or recycling. A LCA of precast concrete underground products can be found at precast.org/sustainability/LCA.

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The Winning Formula

JOSH GAINES

A Master Precaster's continued reliance on education and hard work have paved a path to success.

By Mason Nichols

Josh Gaines has plenty of fond memories from Precast University. But one particular experience stands out from the rest.

Gaines, operations manager at Bartow Precast in Cartersville, Ga., recalls taking the Production and Quality School Level III - Leadership course, taught by Greg Chase, and participating in a roleplaying session with his instructor. In the imaginary scenario, Chase pretended to be a difficult employee and Gaines played the manager tasked with correcting Chase's poor behavior. The only rule? Gaines could not fire his employee. So you can imagine Chase's reaction when Gaines quickly fired him anyway.

"This was a situation where I was trying to implement techniques to get the employee to commit to improvement," Gaines said. "So I

pretended to fire him and it caught him by surprise. I said, 'Well, I'm not really firing you. But if you mess up again, this is going to be the conversation that we have.'

"He's really good at roleplaying and I seemed to catch him off guard with that."

That exchange between Gaines and Chase is just part of what makes the National Precast Concrete Association's Master Precaster program a unique and rewarding experience. Since its inception, 45 professionals have graduated from the program, learning advanced production techniques and skills necessary for continued success and advancement in the precast industry.

For Gaines, who earned his Master Precaster designation in 2014, success and advancement have always been part of the equation. As the son of a third-generation concrete contractor, he knew the meaning of hard work from a young age. Growing up, his father took him to job sites where he would clean tools and help pour sidewalks, driveways and garage floors.

These initial experiences with concrete inspired Gaines to attend Middle Tennessee State University, where he enrolled in the school's Concrete Industry Management program. Although his instructors occasionally talked about precast, he didn't think much of the material until a friend showed him what the industry has to offer.

"I had a good friend that sold precast basement walls as a part-time job, and he was always really positive about using precast and sharing the benefits of precast," Gaines said. "He made a comparison to Legos, and I thought that was pretty neat."

From there, Gaines' love for precast grew, inspiring him to learn even more. Just a month before graduating from MTSU, he enrolled in PQS I to enhance his precast knowledge. At the time, he was also thinking ahead and looking for job opportunities that would kick-start his career. The CIM

Gaines (right) ran the Coosa River Challenge triathlon event in Wetumpka, Ala., with his friend Heath Gilmore.



Photography of Josh Gaines

program provided a big boost.

“The economy was really strong then and the graduates in our program were highly sought after, so we had companies beating down our door wanting us to come work for them,” Gaines said. “Michael Tidwell with Bartow Precast found out about the CIM program through NPCA, at which point he submitted a job listing at the school. I responded to that.”

Gaines got the job. He also ended up taking PQS I with Tidwell, president of Bartow Precast and current NPCA Chairman of the Board. The fit at Bartow Precast was perfect for him since working for a company that valued both continuing education and involvement in a trade organization was his goal.

Over the years, Gaines continued to satisfy his hunger for learning by taking additional PQS courses, including PQS II - Technical, PQS II - QA/QC and others. Then, when NPCA officially rolled out the Master Precaster program in 2009, he set his sights on earning the designation by completing all the required coursework. As he enrolled in more classes, he recognized that one of the program’s major strengths is the quality of the instructors.

“They bring such a great experience to the table,” he said. “That’s kind of why I refer to them as the all-stars of the industry. They’ve had their hands in concrete before and have been there and done that.”

Gaines added he is able to integrate what he has learned into his professional work because the classes are specific to the precast concrete industry.

“I enjoy taking things out of the classroom and trying to figure out how to apply them practically to my job,” he said. “That’s one of the things I like – not just sitting in a classroom for head knowledge, but actually trying to see how that knowledge applies to me specifically in the job that I do.”

With Bartow Precast being – in Gaines’ words – “as busy as ever,” having a hard-working Master Precaster on staff makes a world of difference. Today, he continues to strive for improvement while also focusing on the day-to-day grind – a tough task for any precaster. But as Gaines explained, even though implementing some of the skills and techniques learned in the program can be difficult, continued training is critical to success.

“Education is no substitute for hard work, but when you combine the two, you get something really special,” he said. “The Master Precaster program is a great source for the education part of the equation.” ■

Mason Nichols is the managing editor of Precast Solutions magazine and is NPCA’s external communication and marketing manager.



While attending MTSU, Gaines (fifth from the left) worked on a concrete canoe as part of the American Society of Civil Engineers’ National Concrete Canoe Competition.

“Education is no substitute for hard work, but when you combine the two, you get something really special. The Master Precaster program is a great source for the education part of the equation.”

– Josh Gaines

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MEADOW BURKE HIRES NEW QA/QC MANAGER

Meadow Burke announced that Jennifer Bronson has joined the organization to further develop and manage their overall quality assurance/quality control program.

Bronson has more than 25 years of experience in quality control, having served as a quality engineer and quality manager where she was instrumental in developing and implementing quality



Jennifer Bronson

management systems as well as product control. Some of her certifications and achievements include six sigma black belt, quality auditor and quality/organizational excellence manager.

BHS TWIN-SHAFT MIXERS HELP BUILD TAPPAN ZEE BRIDGE

Coastal Precast Systems and Bayshore Concrete Products Corp. are using BHS twin-shaft mixers to produce precast structural elements, primarily tubs for pile caps and pier caps weighing 300-plus tons, for the Tappan Zee Bridge.

Unique features of BHS mixers include hexagonal shafts which place mixing

paddles 60 degrees apart, outside-mounted V-belts for easier replacement, worm-drive gearbox rather than planetary gears, and shaft bearings mounted in separate bearing boxes to protect them from seal leakage. Driven at around 19 RPM, the closely-spaced paddles promote intense mixing that is 95% complete in as little as 30 seconds.

RICH NOMANSON NAMED GENERAL MANAGER OF ALL CAROLINA CRANE & EQUIPMENT IN RALEIGH

The ALL Family of Companies announced that Rich Nomanson has been named the new General Manager of ALL Carolina



BHS twin-shaft mixers at Tappan Zee Bridge.

Crane & Equipment in Raleigh, N.C. Nomanson has worked for ALL for 19 years – 15 as an operator and the last four as a foreman at the company’s Indiana-based Central Rent-a-Crane.



Rich Nomanson

facility within a half mile of its operation since 1972. The original facility will house construction product manufacturing, while the new plant will lead production of outer burial containers.

Piedmont Precast has also welcomed Dusty McClure to be its technical sales engineer. Dusty’s background includes 18 years of experience in construction management, civil engineering and technical sales. Dusty earned an MBA from Auburn University. He will be assisting the southeast specifying and contracting community with construction projects.

PIEDMONT PRECAST EXPANDS OPERATIONS, HIRES SALES ENGINEER



Dusty McClure

Piedmont Precast, an Atlanta-based manufacturer of specialized precast concrete products, has expanded its operations. The company has purchased a new

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NPCA 50TH ANNUAL CONVENTION

Minneapolis Marriott City Center
Minneapolis, Minn.



March 3-5, 2016
THE PRECAST SHOW 2016

Gaylord Opryland Resort and Convention Center
Nashville, Tenn.



March 2-4, 2017
THE PRECAST SHOW 2017

Cleveland Convention Center and Hilton Cleveland Downtown
Cleveland, Ohio



February 22-24, 2018
THE PRECAST SHOW 2018

Colorado Convention Center and Hyatt Regency Denver
Denver, Colo.



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Advertisers' Index

A.L. Patterson Inc.	51
Advanced Concrete Technologies Inc.	47
All Erection & Crane Rental Corp.	21
BASF Corporation	43
Besser Company	45
BHS - Sonthofen Inc.	27
Bren Inc.	40
Cleco Manufacturing	17
CNA Insurance	41
CONAC, Concrete Accessories of GA Inc. tab	
Elematic Inc.	15
ERMC	11
Formcrete Fiberglass Products Inc.	8
G & K Uniform Services	31
Haarup North America Inc.	2
Hamilton Form Co.	91
iwi group LLC	49
Meadow Burke	73
New Hampton Metal Fab	23
Nox-Crete Products Group	10
Oklahoma/Iowa Steel & Wire Co.	24
Pennsylvania Insert Corp.	24
Polylok Inc.	35
POPIT Inc.	28
Press-Seal Gasket Corp.	13
Robert Ober & Associates LLC.	29
RoMix Inc.	14
Sicoma North America Inc.	21
Spillman Company	92
Strike Products.	36
Strong Products LLC.	tab
Titan II Precast Management System	25
Tucker's Machine & Steel Service Inc.	9
Western Forms Inc.	5

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