A PUBLICATION OF THE NATIONAL PRECAST CONCRETE ASSOCIATION

1

OD

Aggregate Gradation

3 A.

UNDERGROUND STRUCTURE JOINTS

803

NEXT-GENERATION CEMENT

IDENTIFYING A COST-EFFECTIVE ENERGY STRATEGY

SAFETY: THE MOST CRITICAL INVESTMENT

> THE PRECAST SHOW 2023



Superior Supplier

Haarup's vast project experience and wide range of reliable equipment makes it easy for you to either modernize existing plants or build new ones.



Haarup

The Right People To Mix With

Veal

Haarup North America, Inc. 12695 NE Marx Street Building #12 Portland, OR 97230 Haarup

tel: +1-(503)-954-1718 fax: +1-(503)-206-8892 haarupNA@haarup.com www.haarup.com

111

CONNECT WITH US

Want to view a story, ask a question or learn more about Precast Today?



What's Inside

Member Spotlights





42

46

E.C. BABBERT INC.: A BUCKEYE BROTHER ACT

Chuck and Ron Babbert have carved out their niche in the Central Ohio market.

INDUSTRY INFLUENCER: TED COONS

Executive vice president of sales, Afinitas Forming Systems Division





SHOAF PRECAST Precast Shines at Premiere North Carolina Beach Club

Shoaf Precast manufactured and installed a series of tanks to support wastewater system upgrades at Coral Bay Club in North Carolina.

Insights

O7 CHAIR'S INSIGHTS A message from NPCA Chair of the Board Joel Sheets Q1 23

- INDUSTRY INSIGHTS Decelerating growth, rapid monetary tightening and moderating inflation define 2023 outlook
- **GOVERNMENT INSIGHTS** The Lay of the Land: What To Expect in the 118th Congress

Tech Speak

- 12 QUESTIONS FROM THE FIELD
- 14 COMBINED AGGREGATE GRADATION
- 22 UNDERGROUND STRUCTURE JOINTS
- **26** NEXT-GENERATION CEMENT
- **30** CONFLICTING CODES

Management

- **32** A CULTURE OF RECOGNITION
- **36** IDENTIFYING A COST-EFFECTIVE ENERGY MANAGEMENT STRAGEGY

Safety

38 SAFETY: THE MOST CRITICAL INVESTMENT

News

- 54 ASSOCIATION NEWS: The Precast Show 2023 in Columbus, Ohio
- 52 INDUSTRY NEWS: WORKING FOR YOU
- **54** PEOPLE & PRODUCTS
- 55 NPCA CALENDAR OF EVENTS

PRINZING PFEIFFER

Amember of TOPWERK

ENGINEERED FOR EFFICIENCY. BUILT FOR RESULTS.



EXPERTLY ENGINEERED SOLUTIONS FOR THE NORTH AMERICAN PIPE PRODUCER



MACHINERY FOR THE PRODUCTION OF

- CONCRETE PIPES
- CULVERTS
- MANHOLES AND MORE

Contact our facilities in Houston and Toronto for SALES, SPARE PARTS & SERVICE

USA 832-585-1678 or Canada 905-575-4440



PUBLISHER Frederick H. Grubbe, MBA, CAE

> EXECUTIVE EDITOR Tom Rodak

> MANAGING EDITOR Joe Frollo

ASSOCIATE EDITOR Heather Bremer

TECHNICAL EDITOR Chris Frederick

TECHNICAL CONTRIBUTORS

Phillip Cutler, P.E. Claude Goguen, P.E. Hugh Martin , P.E.

GRAPHIC DESIGN Molly Tippner

ADVERTISING Brenda C. Ibitz bibitz@precast.org | (317) 571-9500

Precast Today (ISSN 1940-9184 print, ISSN 1940-9192 online) is published quarterly by NPCA.

Material in this publication may not be reproduced without written permission from NPCA. Requests for permission should be directed to the editor.

© 2023 NPCA

Address your letters and comments to the editor: Precast Today/Editor 1320 City Center Drive, Suite 200, Carmel, IN 46032 (800) 366-7731 | Fax: (317) 571-0041 Email: npca@precast.org

precast.org

NPCA is the trade association representing manufacturers of industrial plantproduced, concrete products and suppliers to the industry around the world.

COVER PHOTO: DREAMSTIME.COM



MANHOLE HOLE FORMERS 30"



NEW SIZES AVAILABLE

MACHINE TAPERED POLY HOLE FORMERS				
Manhole 48x5	Manhole 48x5 Manhole 60x6 Manhole 72			
30	30	30		
32	32	32		
34	34	34		
	36	36		

PRODUCTS





Thank you to Mack Industries for the last 30 years of business.

We look forward to many more





Irving Equipment is a family-owned company that has been selling and servicing knuckle boom cranes for over 40 years in the precast industry.

We offer cranes from 2 to 350 tons in a wide variety of configurations to fit your requirements. Units can be truck, trailer, rolling base, or floor mounted directly in your shop.

Copma cranes are simple and reliable machines with no computers. They use hydraulic overloads to minimize your downtime and headaches. Contact Irving Equipment today about how we can help with your lifting needs.



Chair's Insights

A MESSAGE FROM NPCA CHAIR JOEL SHEETS

THE PRECAST SHOW SETS THE STAGE FOR A GREAT 2023



NPCA Chair

Based in Columbus, Ohio, this year, The Precast Show was another great week. With more than 5,300 precast concrete producers, suppliers and specifiers in attendance celebrating the industry, this time together surpassed all our expectations yet again.

As a vital touchpoint for our NPCA members and the precast community at large, The Precast Show provides a time for camaraderie, connections and opportunities. It is a time to gather alongside colleagues near and far to catch up with old names and welcome new ones. Though I always enjoy reuniting with friends, there was something special about putting a face to a name for the first time.

One of my favorite things to do is walk along the show floor. With more than 120,000 square feet of exhibitors, product demonstrations, food, drinks and more, there is much to see and experience. I hope everyone learned about the new technology and equipment that has become available, attended the educational sessions and enjoyed networking in-between. Nothing beats seeing, touching and hearing about the products that will help our companies prosper into the future – and at The Precast Show is where that starts.

I also would like to thank Chuck, Ron and the team at E.C. Babbert for hosting the Plant Tours this year. A phenomenal time was had, and we appreciate the time you took sharing how your team tackles the same challenges we all face.

Finally, I hope you enjoy the inaugural issue of Precast Today. This magazine is designed to engage NPCA members and project specifiers, show how precast concrete is being used and highlight the men and women who make this building material come to life.

Among the newest features in Precast Today is an industry outlook report that examines topics and trends affecting the industry. You can find the initial report on Page 8. As it has become the norm, there will be challenges in 2023, but the resiliency of precast concrete products is matched only by the strength and adaptability of those who manufacture them.

We hope you enjoy the edition and look forward to the continued success of this publication.

100

Industry Insights

DECELERATING GROWTH, RAPID MONETARY TIGHTENING AND MODERATING **INFLATION DEFINE 2023 OUTLOOK**



By Tom Rodak

Each quarter, NPCA Vice President of Marketing and Communications Tom Rodak takes a look at where the precast concrete industry is and where indicators show it is headed.

2022 presented a host of challenges for the U.S. precast concrete manufacturing industry as higher interest rates, supply chain constraints, labor market challenges and geopolitical tensions created varying levels of turmoil coming out of the COVID-19 lockdown.

As 2023 progresses, many economists feel that inflation will drive the trajectory of the U.S. economy in 2023.

Among forecasters' concerns for the new year are rapid monetary

tightening, supply

drive the trajectory of the U.S. economy in 2023.

In an effort to rein in inflationary impacts, the Federal Reserve started aggressively raising interest rates in March 2022. Should these efforts be successful, rates could stabilize later this year. This would help the economy begin to recover in the later part of 2023.

According to Richard Branch, chief economist at Dodge Data and Analytics: "The Federal

Reserve's ongoing battle with inflation has raised concerns that a recession is imminent in the new year. Regardless of the label, the economy is slated to significantly slow, unemployment will edge higher, and for parts of the construction sector, it will feel like a recession."

Still, Branch feels certain sectors will continue to outperform.

Manufacturing starts, which according to Dodge

chain constraints, a tight labor market, escalating geopolitical tensions and the possibility of recession. However, many economists feel that inflation ultimately will



precast TODAY | Q1 2023

Meeting production demand in 2023 will be a challenge as the industry works through an already volatile construction material supply chain.

Data and Analytics were up 196% in 2022, are expected to slow but remain at historic highs in 2023 as U.S. companies, especially chip fabrication and EV battery operations, continue to shift production back to the United States to take advantage of incentives provided by the 2022 CHIPS and Science Act and the Inflation Reduction Act.

Public funding, primarily through the 2021 Infrastructure Investment and Jobs Act, also will support nonbuilding, infrastructure and public works projects. According to Dodge Data and Analytics, infrastructure and public works projects are expected to see the biggest gains in 2023 with forecasts for dams and reservoirs up 15%; water supply systems up 12%; sewage and waste up 17%; and nonbuilding and infrastructure starts up 16%.

Expected Public Funding Projects for 2023

DAMS & Reservoirs	15%
WATER SUPPLY Systems	12%
SEWAGE & Waste	17%
NONBUILDING & Infrastructure	16%

However, the pace at which government-funded projects get into the queue is slowing.

"We also need to consider the fact that the appropriation process in Washington has slowed down," Branch said. "There was a delay in getting the fiscal year 2022 funding approved. There already is a delay getting the Cement and concrete prices will remain close to current highs driven by elevated production and transportation costs.

fiscal year 2023 funding approved for infrastructure projects." Meanwhile, rising mortgage rates and slow economic growth could put a drag on the residential sector and parts of the commercial sector, specifically warehouses and office construction. According to Dodge Data and

Analytics, the residential market will experience a mild

downturn with SFH starts and MFH starts expected to be down 6% and 9%, respectively. On a positive note, the single-family market can expect to see gains again in late 2023, and the multi-family market is expected to rebound in early 2024.

Starts in the institutional sector are expected to remain flat overall with year-over-year growth in health care construction and transportation projects, largely driven by multi-billiondollar improvements at John F Kennedy International Airport and some other terminal and runway projects.

Meeting production demand in 2023 will be a challenge as the industry works through an already volatile construction material supply chain.

Cement allocations and longer lead times will continue across the United States but are expected to improve toward the back half of the year. According to a commodity report from Linesight, a global construction consultancy, cement and concrete prices will remain close to current highs driven by elevated production and transportation costs.

A final thought as we look to 2023. According to Branch, total construction starts overall in 2022 rose by 17% and are expected to remain flat through 2023. These continued high levels are a relatively optimistic forecast for a period of anticipated economic stagnation.



Ensure output and product quality through automation.

Digitization is the key to model-based prefabrication and guarantees sustainable, efficient use of resources

Gain access to the centre of excellence for smart production!

www.rib-saa.com

Government Insights

THE 118TH CONGRESS: WHO IS DRIVING, AND WHERE ARE WE HEADED?



By Rachel Derby

Rachel Derby is coprincipal of Innovative Advocacy, which works with NPCA to advance the interests of the precast concrete industry in Washington, D.C. It's a bird. It's a plane. It's the new Congress!

The 118th Congress already is up in the air: from national flight delays to unidentified flying objects to a cloud of uncertainty over House leadership and Kevin McCarthy (R-Calif.) becoming Speaker after a historic 15th ballot.

It will take a Super-Congress to address national transportation issues facing the United States alongside economic, workforce and global concerns.

Congress has a clear transportation agenda, partially driven by politics and the need to reauthorize key programs. Sam Graves (R-Mo.), chair of the House Transportation and



Infrastructure Committee, who served as the ranking member the past four years, laid out his priority for the committee. Americans can expect oversight on the implementation of the \$1.2 trillion Infrastructure Investment and Jobs Act. Questions on how the money is being spent, how quickly it is

Speaker of the House Kevin McCarthy (R-Calif.) holds the gavel after he was elected on the 15th ballot. going out and possibly pulling back on some infrastructure areas.

Expect a show, but don't expect a major impact to the Biden Administration's marquee legislation.

The Transportation and Infrastructure Committee agenda also is driven by upcoming deadlines to reauthorize programs before expiration. Notably, the Federal Aviation Administration needs to be reauthorized by Sept. 30.

Recently, the FAA halted thousands of flights nationwide



after a pilot notification system failed. Congress is focused on updating the critical-alert system that caused this failure. The agency is looking to modernize the system in advance of the 2030 scheduled deadline and requesting additional funds for support. The House has announced an aggressive timetable for a floor vote in July on the FAA package.

The House Transportation and Infrastructure Committee must pass the Water Resources Development Act of 2024 before the end of this Congress. This program authorizes new U.S. Army Corps of Engineers chiefs reports to advance restoration, flood risk management and hurricane and storm risk reduction projects across the country.

Passage of a WRDA bill will continue the cycle of legislation every two years to advance U.S. Army Corps of Engineers projects. This generally is a bipartisan effort.

Rep. Virginia Foxx (R-N.C.) reclaims her position as chair of the House Education and Workforce Committee. Previously, she chaired the committee from 2017-19. One of Foxx's major interests is in workforce development, overseeing the Strengthening Career and Technical Education for the 21st Century Act, which would assist Americans in gaining skills and knowledge to enter the workforce and compete for in-demand industry jobs.

Foxx has outlined her agenda, indicating workforce development will be at the top of the committee's priorities.

Beyond Congress, the Biden Administration also announced requirements that all construction materials in federal



U.S. Senate Majority Leader Charles Schumer (D-N.Y.) speaks to press for the first time after midterm elections as Democrats retain Senate majority.

infrastructure projects be made in the United States. The White House is proposing guidance to set domestic manufacturing standards for construction materials. It is imperative that precast materials be included in this guidance.

With a divided Congress and narrow margins for both parties, any meaningful legislation must garner bipartisan support.

Watch NPCA's blog site (Precast.org/ blogs) for updates from Washington and statehouses.

MAX developed the World's First battery powered rebar tying tool in 1993 and has a history of manufacturing durable and reliable industrial tools for 80 years. Since then, MAX rebar tying tools have revolutionized rebar tying work in precast plants and a variety of other jobsites all around the world.

All MAX products are engineered to perform on professional contractors jobsites and with MAX's 200 R&D engineers we have continued to improve upon MAX proprietary technology, which led to the invention of the TWINTIER® rebar tying tools. TWINTIER® technology allows the tools to tie 4,000 ties per charge while delivering just the right amount of wire for greater productivity and cost savings. These unique innovative features make the TWINTIER® the most efficient rebar tiers in the industry. Today, MAX manufactures a full line of rebar tying tools that can tie between mesh up to #9 x #10 rebar.

ENGINEERED FOR PERFORMANCE



MAX USA Corp. • 205 Express St. Plainview, NY 11803 • U.S.A. • Phone: (800) 223-4293 • FAX: (516) 741-3272 • www.maxusacorp.com

Questions from the Field

QUESTIONS FROM THE FIELD IS A SELECTION OF QUESTIONS NPCA TECHNICAL SERVICES ENGINEERS RECEIVED FROM CALLS, EMAILS, PLANT EVALUATIONS AND COMMENTS ON BLOG POSTS OR MAGAZINE ARTICLES POSTED TO PRECAST.ORG.

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

CHRIS ASKS:

WHEN PRODUCING VAULTS, CAN WE BUTT OR CROSS THE HORIZONTAL BARS IN THE WALL CORNERS AND WELD THEM TOGETHER?

NPCA TECHNICAL EXPERTS ANSWERS:

Butt joining or crossing and welding horizontal reinforcing in the corners of vault walls does not provide the reinforcement continuity around the vault wall corner required for strength. We suggest using U-shaped horizontal bars and lapping them down the long wall with the minimum lap splice required by code.

For an example of proper horizontal reinforcement across vault wall corners, see the photo below.

Also note that if your vault top slab and base slab are monolithically cast with the vault walls, the vertical wall reinforcing must develop (hook) into the top slab and base slab a



Horizontal bars are butt welded in the corners (left). A better approach is proper horizontal reinforcement across vault wall corners as illustrated in photo above minimum amount, depending on the bar size.

We recommend consulting with your engineer to determine the required lap splice lengths and hooked bar lengths as there are many variables in determining the minimums allowed by code.

JAMES ASKS:

HOW CAN I DOUBLE MY PRODUCTION NOW? MY NEW FORMS ARE AT LEAST SIX MONTHS OUT.

NPCA TECHNICAL EXPERTS ANSWERS:

Facing inventory shortages when demand is booming is a real problem for many precasters in today's market. NPCA engineers suggest you consider the following potential solutions when your new forms are not ready yet.

Double pouring is an option, but it takes a systematic and deliberate approach to be successful. Your first pour of the day has to be right or things fall apart quickly since time is not on your side.

The first step is to call your admixture supplier for assistance. Dosing your mix with accelerator may get you started, but it is likely that you will have to consider a more aggressive approach.

Next, you can change your mix design further by switching to a Type III cement (if available) along with the accelerating admixture. In either case, your admixture supplier likely is the key to success with this approach.

Finally, combine either of the options above with heat and/ or moisture to the curing cycle. How much heat and/or moisture is needed is the tricky part. You likely will need at least six hours of an accelerated curing cycle to be able to strip forms without product damage.

Once you decide on the path, we suggest a systematic and documented approach.

We suggest that you consider the following article as an excellent place to start: Precast.org/2021/06/double-pouring.



INNOVATIVE RELIABLE VERSATILE

The Advantage Series BiDi®, Adjustable Box Culvert Equipment, and Servopac® Select, three solid examples of Besser ingenuity.



Tech Speak

By Claude Goguen, P.E.

Claude Goguen, P.E., is the director of outreach and technical education at NPCA. When looking to make improvements on concrete mix design, it is natural to first gravitate to the water-tocementitious materials ratio, cementitious materials type and amount, admixtures and air content. These are all good considerations, but the mix component that occupies more than 70% of the concrete volume often is overlooked.

AGGREGATES

These natural particles are the backbone of every good, quality mix. They must be clean, durable and free from deleterious material and supplied in gradations that fall within the parameters of the applicable standard, which typically is ASTM C33 – Standard Specification for Concrete Aggregates or AASHTO equivalents M80 and M6.



Figure 1. Gradation requirements of ASTM C33. Credit: PCA Design and Control of Concrete Mixtures

Aggregate gradation significantly influences concrete quality. This one characteristic can control a product's durability and sustainability while having a significant impact on the cost per yard.

However, instead of analyzing the traditional binary blends of fine and coarse aggregates discreetly, producers should go a step further and analyze the gradation of all aggregates together or – in other words – combined aggregate gradation.

This additional analysis results in better fresh concrete workability and overall product quality while potentially saving money.

"Producers need to look beyond price per ton of aggregates," said Paul Ramsburg, district manager at Sika USA. "Think about it in terms of price per cubic yard or price per finished structure. Spending a little more on sand and stone blends to optimize gradations may result in overall decrease in costs of a cubic yard of concrete that could exceed that initial aggregate investment."

Terry Harris, director of technical services at GCP Applied Technologies, added: "Some producers are hesitant to look at combined aggregate gradation. Maybe they only have two aggregate bins, so they are limited to one stone and one sand. But there's still an opportunity to optimize gradation by choosing the best coarse aggregate blend and by choosing the optimal coarse/fine proportions."

LESS IS BEST WITH PASTE

Concrete is defined by its individual materials such as fine and coarse aggregates, water and cementitious materials. The two most important for this discussion are aggregates and paste.

Aggregates simply are the total amount of sand and stone in the mix. Paste is cementitious materials, water, air and admixtures. When blended, this liquid surrounds the aggregate particles and guides them through formwork between rebar and blockouts. As it continues to set, it holds sand and stone in suspension to eventually form hardened concrete.

When producing high-quality concrete, strive to use the least amount of paste in order to achieve the plastic properties needed to properly place concrete. For one, paste contains ingredients that are higher priced. And in terms of durability, the majority of potential issues such as shrinkage and deterioration involve paste.

Good concrete needs enough paste to cover the aggregate particles' surfaces and additional spacing to provide the workability needed to place concrete and consolidate it. That extra room means more paste to provide the workability needed by the fresh concrete matrix. The amount of extra paste depends on a few factors, including the type of aggregates and the paste's cohesiveness.

"The type of aggregates will have a big impact," said Jay Shilstone, technical product manager with Command Alkon. "Rough, angular aggregates need more space between particles than rounded aggregates."

Other factors on combined gradation include formwork complexity and reinforcing along with the desired finish. A product that must be troweled smooth or broom-finished benefits from modifications to the combined aggregate gradation of a concrete that is simply leveled and floated.

The type of concrete will also impact ideal combined gradations. For example, self-consolidating concrete (SCC) performance relies more on optimized combined gradation than conventional or dry cast.

What's the right amount of paste? There's no magic number. But performing a combined aggregate gradation analysis is the next best thing.

AVOIDING VOIDS

Figure 2 on Page 16 shows a progression that begins with a clear jar filled with large, smooth aggregates. While these aggregates differ in shape, they are around the same size. Note the large air voids between these aggregates. These voids would have to be filled with paste. Filling the jar with water can give an indication of how empty the voids are.



Figure 2. Various gradations of aggregates in clear jar.

The second photo shows the addition of a slightly smaller aggregate. While some voids remain, the smaller aggregates find their way among the larger particles to reduce the gaps. Less water – representing less paste – is now needed to fill in.

The third and fourth photos show the addition of even smaller aggregates. Comparing photos 4 and 1 clearly indicates the different amounts of paste needed to fill the voids.

The science behind this phenomenon is called packing. To enhance packing, first examine how fine and coarse aggregates combine to reveal gaps in gradation not visible on traditional, discreet curves. These gaps often exist between the upper end of the fine aggregate and lower end of the coarse aggregate gradations.

To fill that gap, aggregates sometimes are referred to as an intermediate- or medium-sized aggregates that improve aggregate packing. A 2011 study at the University of Toronto titled "Optimization of Aggregate Gradation Combinations to Improve Concrete Sustainability" found that an inclusion of an intermediate-sized aggregate material reduced cement paste up to 16% for a 7250 psi compressive strength mix.

For a project requiring thousands of cubic yards of concrete, 16% is significant.

METHODOLOGIES

Throughout this article, the following blend of aggregates will be used and adjusted as an example. Coarse aggregates are a 67 blend along with some manufactured sand. A mix design for 1 cubic yard of concrete has 1,725 pounds of coarse aggregates and 1,367 pounds of sand. The coarse aggregates have a specific gravity of 2.5, and the sand has a specific gravity of 2.6.

To begin analyzing combined aggregate gradation, the percentage of each aggregate by volume must be calculated. Here is an example: To determine the volume of each aggregate, use this formula:

Volume =
$$\frac{\text{Weight}}{\text{SG x 62.4}}$$

The 62.4 pounds per cubic foot is water density. For this example, we would have:

CA Volume =
$$\frac{1,725 \text{ lbs}}{2.5 \text{ x } 62.4 \frac{lbs}{ft^3}}$$
 = 11.06 ft³ FA Volume = $\frac{1,367 \text{ lbs}}{2.6 \text{ x } 62.4 \frac{lbs}{ft^3}}$ = 8.43 ft³

Total aggregate volume = $11.06 \text{ ft}^3 + 8.43 \text{ ft}^3 = 19.49 \text{ ft}^3$

To calculate percentages of each aggregate to total aggregate content, do the following:

FA % =
$$\frac{\text{FA Volume}}{\text{Total Agg Volume}}$$
 x 100 = $\frac{8.43}{19.49}$ x 100 = 43.3%

With these percentages, create a combined aggregate gradation table.

	CA (No. 67)	FA	Combined Gradation	
Agg Proportions	56.7	43.3	cumulative	individual
Sieve	% pa:	ssing	% passing	% retained
1½"	100	100	100.0	0.0
1"	100	100	100.0	0.0
3/4"	98.8	100	99.3	0.7
1/2"	63.5	100	79.3	20.0
3/8"	35.9	100	63.7	15.6
#4	4.9	99.9	46.0	17.6
#8	2.2	98.4	43.9	2.1
#16	0	87.5	37.9	6.0
#30	0	60.1	6.0	11.9
#50	0	22.6	9.8	16.2
#100	0	4	1.7	8.1
1	2	3	4	5

Table 1

The percentage of each aggregate is shown in light blue.

- · Column 1 is the sieve sizes for all aggregates.
- Columns 2 and 3 contain the percentage passing those sieves for the coarse and fine aggregates.
- Column 4 is the aggregates as combined. The formula to calculate the percentage passing each sieve is as follows:

(%CA/100 x %passing CA) + (%FA/100 x %passing FA)

For No. 8 sieve: $(0.567 \times 2.2) + (0.433 \times 98.4) = 43.9\%$. This represents the total percentage passing from all aggregates.

- Column 5 represents the percentage of total aggregates retained individually on each sieve. It is obtained by calculating the difference in cumulative percentage passing between the current sieve and the next larger sieve.
- For No. 8 Sieve: Individual % retained = 46.0% minus 43.9% = 2.1%

The preceding table represents the most significant step toward optimizing combined aggregate gradation. Recording this data and comparing it to other aggregate deliveries helps measure consistency. It also enables producers to see potential issues in fresh concrete behavior prior to making the first batch.

The data from the previous example can be graphed in a spreadsheet with sieve sizes on the x axis and percentage passing on the y axis. See Figure 3 below.



Figure 3

Some graphical methods of combined aggregate gradation analysis were developed using percentage passing data.

Developed in 1907 and used primarily by the asphalt and concrete industries, the Power 45 curve provides a logarithmic range of sieve sizes on the x axis and the percent passing on the y axis. The gradation results from our previous example have been plotted on this example below. (Figure 4)



Figure 4

The closer the actual gradation curve is to that straight line, the more optimized the gradation.

The Coarseness Chart method was developed in the 1980s by J Shilstone and is based on aggregate proportioning using the combined gradation to proportion a group of sieve sizes that can be categorized as coarse, intermediate and fine aggregates. A

"Spending a little more on sand and stone blends to optimize gradations may result in overall decrease in costs of a cubic yard of concrete that could exceed that initial aggregate investment."

- Paul Ramsburg, Sika USA

coarseness and workability factor is calculated based on the two formulas in this method and plotted on the graph.



Figure 5

Coarseness Factor (CF) = $(Q/R)^*100$

Workability Factor (WF) = W + (2.5(C-564)/94)

- Q =cumulative % retained on the 3/8 Sieve
- R =cumulative % retained on the No. 8 Sieve
- W = % passing the No. 8 Sieve
- C = cementitious material content in lb/yd^3

Different zones on the chart delineate aggregate gradations and mix workability (Figure 5). To effectively use the Shilstone Coarseness Chart, select a point in the chart based on the desired



properties and back calculate to find the aggregate proportions. This method was not specifically designed for precast concrete mixes, especially SCC.

A graph also can be plotted with individual percentage retained on the y axis versus sieve size on the x axis. Using the previous example, the graph would look like this: (Figure 6)



Figure 6

A few methods of analysis were developed using the graphical system. The Individual Percent Retained Chart – or 8-18 Method – evaluates a distribution of combined aggregate gradation sieve sizes within a given recommended envelope (dotted line) that represent a minimum 8% and maximum 18% retained on each sieve. (Figure 7)



Figure 7

The blue line represents data from the example. Most of the gradation is within the 8-18 envelope, except at the No. 8 sieve. The gap in this size aggregate could be an issue.



Dan Cook and Tyler Ley developed the Tarantula Curve method in 2013 specifically for use with concrete pavements. It is similar to the 8-18 Method, but the envelope is adjusted based on performance testing, comparing the workability of more than 500 different mixtures. (Figure 8)



Figure 8

The resulting upper and lower limits form a shape similar to a spider, thus the name. Developers found that the desirable overall combinations that fall within the Tarantula Curve provide improved workability and resistance to segregation. Once again, the blue line represents the data from the previous example.

Coarse aggregates retained on sieves 1 inch to No. 4 that are near or exceeding the upper range of this curve can increase the risk of segregation and decrease workability. Coarser sands retained on sieves Nos. 8 to 30 play a role in mix cohesion. Too little of this aggregate range could lead to segregation. The finer sands retained on sieves 30 and above impact mix consolidation and finish.

The entire graph from the example data falls within these limits, but that's no guarantee of optimum performance.

The Tarantula Curve originally was designed for concrete paving





and is more suited for conventional concrete mixes. For SCC mixes, the limits will differ. An example of a modified combined gradation curve for precast SCC mixes. (Figure 9)

When comparing this graph to the Tarantula curve, it is evident there is more emphasis on mid-range aggregate sizes. That is due to the fact that having a higher percentage of this mid-range aggregate will produce the optimum performance that SCC requires.

The blue line represents the results from the example data. If this were an SCC mix, the first concern would be lack of intermediate sized aggregates in the No. 4 to No. 8 range.

This could be improved by mixing in another gradation of coarse aggregates and adjusting the percentages. Adding 15% of a No. 89 blend, reducing the No. 67 blend to 50% and reducing the sand percentage to 35%. The new table is:

	CA	FA	Combined Gradation			
Sieve	#67	sand	Sieve	% passing	% retained	cumulative % retained
1½"	100	100	1½"	100.00	0.00	0.00
1"	100	100	1"	100.00	0.00	0.00
3/4"	98.8	100	3/4"	99.40	0.60	0.60
1/2"	63.5	100	1/2"	81.75	17.65	18.25
3/8"	35.9	100	3/8"	67.95	13.80	32.05
#4	4.9	99.9	#4	52.40	15.55	47.60
#8	2.2	98.4	#8	50.30	2.10	49.70
#16	0	87.5	#16	43.75	6.55	56.25
#30	0	60.1	#30	30.05	13.70	69.95
#50	0	26.6	#50	13.30	16.75	86.70
#100	0	4	#100	2.00	11.30	98.00
#200	0.8	0.25	#200	0.525	1.48	99.48
Agg % by volume	50	50				

Table 2. Aggregate gradations for example mix.



The resulting modified graphic is show below.



Figure 10

The previous aggregate combined gradation can still be seen in blue, and the adjusted one is in red. Peaks at the high and low end of the combined aggregates were reduced and the larger gap near No. 4 to No. 8 sieves was improved.

At this point, a producer could run a test batch to see how the concrete behaves while mixing, placing and finishing. Fresh and hardened concrete tests could be run and, based on the results, further modifications could be required.

Otherwise, this combined aggregate gradation would be considered optimized for the given materials and conditions.

WHAT TO DO NOW?

Starting down the road of optimizing combined aggregate gradation can be daunting, but the payoff makes the effort worthwhile. Check with the admixture supplier for specific methods or programs. Regional admixture representatives are better equipped to help since they are aware of relevant conditions. Nothing beats local knowledge.

Otherwise:

- Create spreadsheets and plot simple gradation charts. Create one for fine aggregate fineness modulus to assess consistency between aggregate deliveries.
- Look for vendors that supply mix design and combined aggregate gradation optimization software.

While combined aggregate gradation methods originated for the paving industry, the precast industry is wellsuited for this quality control process because of early-age loading, durability requirements and the wide use of SCC.





This is Afinitas.



Intelligent Infrastructure Solutions

Afinitas is the team of experts relied upon for decades to help bring quality concrete products to market faster. We continue to innovate with a broad range of labor-saving equipment, custom formwork and concrete accessories. Coupled with our vast parts inventory and global service team, we have built a platform of products and services unlike any other to solve your challenges today and prepare you for tomorrow. This is Afinitas — your partner for the future of infrastructure technology.

Learn more at www.afinitas.com



Intelligent Infrastructure Solutions Afinitas is a global, comprehensive and customer-oriented infrastructure equipment and services platform that brings together the expertise of HawkeyePedershaab, BFS, New Hampton Metal Fabrication, Spillman, and CAM Products.

Headquarters: 8040 Forsyth Blvd. | St. Louis, MO 63105 USA | +1 314-726-2178 | info@afinitas.com

Underground Structure Joints

KNOW YOUR SYSTEMS AND MATERIALS IN ORDER TO KEEP EVERYTHING TOGETHER



By Eric Carleton, P.E

Eric Carleton, P.E., is a former director of codes and standards at NPCA. He is an ASTM fellow and former chairman of C13.08 Precast Concrete Joints subcommittee. In an ideal world, all precast concrete structures would be cast at the plant monolithically in a single high-quality section.

In the real world, limitations such as transport dimensions and handling weight force us to cast structures in multiple sections.

The performance of the entire modular system depend on the quality of the joint system and material between adjacent sections.

For typical buried precast structures, joint configurations are based on performance needs and the current ASTM standards available to specify them.

KNOWING WHAT TYPE OF JOINT TO SPECIFY

Proper precast structure joint design starts with appropriate performance requirements to meet a project application. Higher requirements translate to higher risk and, consequently, higher cost.

Specifying leak resistant pipe and structure joints along with resilient rubber booted structure connections may not be the optimum economical design if that same structure also accepts perforated subsurface drainage pipes.

Similarly, a sanitary sewer structure placed in the ground with a high water table requires the highest available leak resistant joint system to minimize any groundwater added to the effluent, which creates significant long-term treatment costs at the wastewater treatment plant.

Finding this balance often is the result of decades of experience with appropriate design performance. For new designers, though, two main resources are available to assist.

JOINT DESIGN RESOURCES

The American Association of State Highway and Transportation Officials (AASHTO) in 2009 adopted "PP-63 Pipe Joint Selection of Highway Culvert and Storm Drains," now designated AASHTO R 82, which provides guidance for designers to specify the appropriate performance requirements for different pipe jointing systems based on four defined field performance expectations.

- Soil tight
- Silt tight
- Leak resistant
- Special design

As the title suggests, this guide is geared toward pipe joints. However, the terms, concepts and methodology equally are appropriate for precast structure joints on manholes, storm inlets, vaults and other buried precast structures.

Each joint type is defined as follows:

▶ Soil-tight joint. A joint that is resistant to infiltration of particles larger than those retained on the No. 200 sieve (openings measuring 0.003 inches or 0.75 mm). Soil-tight joints provide protection against infiltration of backfill material containing a high percentage of coarse grain soils and are influenced by the size of the opening (dimension normal to the direction that the soil may infiltrate) and the length of the channel (length of the path along which the soil may infiltrate).

▶ Silt-tight joint. A joint that is resistant to infiltration of particles that are smaller than particles passing the No. 200 sieve. Silt-tight joints provide protection against infiltration of backfill material containing a high percentage of fines and typically utilize some type of filtering or sealing component, such as an elastomeric rubber seal or geotextile.



Leak-resistant joint. A joint that limits water leakage at a maximum rate of 200 gallons/inch-diameter/mile/day for the pipeline system considering the project-specified head or pressure.

▶ Special-design joint. Joints requiring special strength in bending, shear or pull-apart capabilities or unusual features such as restrained joints placed on severe slopes, welded joints or flanged and bolted joints for high pressures, high heads or velocities. These typically are described within special provisions of the project specifications.

Included within the guide is a helpful flow diagram describing differing project design performance requirements and the appropriate joint system to be employed within the four groups.

From a practical design standpoint, engineers often simply differentiate between the need for a silt-tight joint system or a leak-resistant joint system. For precast structures, special-design joints typically relate to additional considerations relating to structural loading – shear or lateral – special assembly or restrained joint needs rather than leakage requirements.

This guide provides clarification on terms and is a training tool for an engineer who may not be familiar with buried precast structure performance and plant verification criteria.

Another resource is local precast industry representatives. This could be through a local or regional precast association or directly with the precast production facilities within the project location.

Though there are nationally recognized ASTM standards describing differing joint systems and plant testing verification methods, not all are commercially available throughout North America. A listing of NPCA Certified Plant members with contact information showing their locations and precast product lines can be found on the NPCA website.

ASTM C13.08 & ASTM JOINT STANDARDS

Once a joint performance criterion is established, a specific joint type or sealing system often is described or specified within project requirements. Project documents benefit by referencing various ASTM joint standards that have been specifically developed for precast concrete pipe and structure joints.

The ASTM subcommittee solely responsible to develop and maintain current standards for precast pipe and structures GROOVE (BELL) END

TONGUE (SPIGOT) END

Figure 1. Typical vertical T&G Joint in vertical orientation. Flexible sealant placement location at "E" and/or "B." For flexible sealant areas, no gap of adjoining mating surfaces should exceed 3/8 inch prior to the placement of the sealant. is C13.08 "Joints for Precast Concrete Structures." This subcommittee meets twice each year to review and update existing standards and to develop and ballot new joint standards. Currently, the ASTM standards pertinent to buried precast concrete structures are:

- C443. Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- C877. Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
- C990. Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

Most precast joint configurations focus on pipe joints. The horizontal orientation of a buried pipe joint introduces differential shearing loads across the joint that requires the sealing mechanism to be evaluated in different scenarios. This not only includes an ideally homed joint in a centered position but also a joint deflected position, typically opened not less than a half-inch on each side.

Buried joints also need to be analyzed in an off-center position or shifted to a point of concrete-to-concrete contact between the bell and spigot on one side of the joint and maximum open annular space on the opposing side of the joint.

For buried precast structures, the typical jointed connections are oriented vertically. This important distinction provides joint sealing benefits not realized when compared with the horizontal pipe joint orientation.

The first alteration is the weight of the newly joined structure bearing down upon the previously installed section. This load provides a high uniform force to "home" the joint and maintain the connecting force throughout the installation. This downward force is beneficial for joints utilizing flexible bitumen or butyl rope sealants – per ASTM C990 – as the primary means to meet or exceed traditional joint performance expectations.

A flexible sealant is placed on the joint surface where the two sections bear against each other. This is the end of the groove onto the tongue shoulder or vice versa. It is important for the joint forming equipment and the facility's production practices to provide uniform joint surfaces of the two mating sections that do not exceed the specified gap between the two at any location. This typically is 3/8 inch prior to sealant placement per ASTM product standards for septic tanks (ASTM C1227) for gravity grease interceptors (ASTM C1613) and water and wastewater structures (ASTM C913) or less if required by sealant manufacturer.

Another accepted design assumption for vertical joint orientation is that mated joints maintain a centered position because of uniformly placed backfill around the structure perimeter to eliminate side shearing loading. For circular sections, this creates a uniform annular space between the bell surface and spigot surface as defined within ASTM C443. (Figure 2)



Figure 2. Typical vertical single offset spigot and bell joint that can utilize either a profile elastomeric gasket or flexible bitumen or butyl rope sealant. For gasketed joint applications, critical joint areas are along the gasket sealing areas shown as "H" and "B." Additionally, the distance between the bell and spigot shall provide an annular space such that the furnished gasket when installed and compressed will fall within the required maximum and minimum deformation limits. If employing a flexible rope sealant, the critical areas are where the bell and spigot come in contact with each other and placement of the sealant will occur. No gap of adjoining mating surfaces should exceed 3/8 inch prior to the placement of the sealant. For joints using elastomeric gaskets (per ASTM C443) as the sealing medium, this provides uniform gasket deformation through the entire joint perimeter and a higher assurance of leak resistance. Elastomeric gaskets as a sealing mechanism require a much higher level of tolerance in the concrete joint than a flexible rope sealant system. The precast production process needs to implement pre- and post-pour production practices to ensure tolerance levels are being met.

Since the turn of the 20th century, precast farm drainage tiles have utilized external joint wraps to keep joints soil tight. The original tar paper wraps have given way to a variety of non-woven geotextiles that when properly applied provide superb silt and soil tightness both horizontally and vertically.

Additionally, the use of high quality, impervious joint wrap systems (ASTM C877) provide leak resistance when installed in accordance with the manufacturer's requirements. Like other joint systems, vertical precast structure joint installation of external joint wrap systems is less cumbersome than placing the same wrap system around and under a horizontal pipe joint, in and through the pipe bedding. A vertical precast structure joint is up out of the soil with all sides easily exposed, clean and accessible.

QUALITY JOINTS – QUALITY STRUCTURES

The inground performance history of buried precast concrete structures have shown them to be the most adaptable, constructable, resilient, durable and cost-effective when compared to other alternate products on the market. Transportation and construction handling limits often require a precast structure to be comprised of many adjoining precast components. With such a segmental connection, there might be a design concern that the joint areas would be problematic toward the structure performance expectations. However, with the many joint options available to meet and exceed the appropriately specified joint performance needs, these connections are no "weak link" within the chain of a quality precast system.



Precast Proude is a trademark of National Precast Concrete Association and is used with permission.

it's what's inside that counts...

STRONG & DEPENDABLE REBAR SPACERS & CONCRETE ACCESSORIES



Push-On & Locking Wheel Chairs 7/8", 1", 1.5", 2" & 3"



Mesh Chairs 1, 1.5, 2 & 3



Viper-Lok™ Flat, 1°, 1.5° & 2°



Stackable Bolsters (44") .75", 1", 1.25", 1.5", 1.75", 2", 2.25", 2.5", 2.75", 3", 3.5", 4", 4.5" & 5"



Stackable Chairs 1.5" - 2" & 2.5" - 3"

Beam Bolster Uppers

(44") 1", 1.5", 2", 2.5", 3", 3.5", 4", 4.5" & 5"



Tilt Up Chairs 3/4"-1", 1.25" - 1.75", 2.5" - 2.75", 3" - 3.25", 4" - 4.25" & 5" - 5.25"



X-Chairs 0.5", 0.75", 1", 1.5" & 2"



Round Base Chairs 1.5" - 2", 2.5" - 3", 3.5" - 4" & 5" - 5.5"



Pyramid Wire Clips 0.75, 1", 1.25, 1.5" & 2"



Visit our web site for our complete line of more than 200 precast products www.polylok.com / 1-877-765-9565



Next-Generation Cement

WHAT'S GOING TO MAKE IT A REALITY?

By Michael Ireland

Michael Ireland is president and CEO of the Portland Cement Association.

From a rush among developers to remove carbon from every part of their construction projects to major cities considering net zero building codes, the drive to cut carbon from tomorrow's structures is gaining momentum.

Commercial real estate companies are seeing a trend among clients who prefer moving into buildings that meet certain sustainability metrics as they seek to lower their Scope 3 greenhouse gas emissions. In the residential sector, states and counties are starting to enact building codes that limit carbon emissions from concrete.

By taking a holistic view of these trends, it is clear that demand for lowcarbon materials only will increase in the coming years. Fortunately, the U.S. cement industry is ahead of this shift in consumer demand and regulatory policy.

The industry has been focusing on reducing its carbon emissions since the mid-1990s, has already developed lowercarbon blends like portland-limestone cement (PLC) and is working to further reduce carbon from its products while also dramatically cutting emissions from its manufacturing processes – with an ultimate goal of carbon neutrality even as demand increases.

From decarbonization technologies to innovations in process optimization, the timelines for new products with lower carbon footprints vary, but there are existing low-carbon cements that can act as a powerful short-term lever for CO₂ reduction.



LOWER-CARBON CEMENTS

Lower-carbon cements are on the market, and the industry is on the cusp of much greater consumption of PLC, a product that reduces CO_2 emissions by about 10% and is just as durable as traditional portland cement. Currently, 46 state departments of transportation – major consumers of cement – have approved the use of PLC. Increased market acceptance has spurred cement manufacturers to shift production in multiple plants entirely to PLC as innovation continues.

Beyond PLC, ternary blended cements – mixes that incorporate by-products from other industrial processes such as fly ash or calcined clay – promise similarly high performance with significant CO₂ reduction. Ternary cements are still in the early stages, but cement manufacturers outside the United States are pushing for greater market preparedness, such as standardization in Europe.

The widespread usage of these products is the low-hanging fruit in the push to carbon neutrality with PLC and ternary blends offering immediate opportunities to reduce emissions. Longer-term levers to decarbonize cement plants are in development, and some are ready for implementation.

HIGH-TECH OPTIMIZATION

One such lever is the increased use of technology to optimize cement production, particularly through artificial intelligence (AI) and machine learning (ML).

Today, plant optimization is a difficult task, given the high number of process variables and adjustments needed in real time. But studies have identified five areas in which AI and ML can create a smarter - and greener - cement plant. The first of these is predictive maintenance, in which ML processes can analyze historical and real-time data to predict breakdown occurrences and the need for preventative maintenance. Using ML in this way could reduce maintenance costs by 20% and vastly improve efficiencies as a result. Additionally, both AI

and ML digitally can recreate a cement plant to analyze process data and other variables to model them in a variety of scenarios, enabling plant operators to maximize efficiencies in the physical plant. Predictive analytics can analyze the quality of cement in real time, leading to



It is clear that demand for low-carbon materials only will increase in the coming years.

the optimal use of limestone, milling time and other processes – further maximizing efficiencies and reducing costs in the meantime.

AI and ML also can be used to optimize the combustion of alternative fuels in a cement plant, using non-fossil fuelbased materials for energy – a technology that already is in use in some cement plants that are looking to shift to 100% alternative fuels in the near future. Finally, these technologies can be used to optimize the cement supply chain, improving traceability in the process.

STOPPING EMISSIONS BEFORE RELEASE

While some process optimization technologies start to appear on the market, another carbon reduction technology with the potential to stop emissions before they are released has taken its first tentative steps toward commercialization.

There currently are four cement plants in the United States – such as a collaboration between Lehigh Hanson (now called Heidelberg Materials) and Fortera in Redding, Calif., and two other plants that recently received funding





STOP wasting valuable time! **STOP** using rocks and mortar! **START** using the POPIT plug that will fill AND cover lift holes in one easy step!

START using POPIT that was designed to fit multiple size openings.

START saving time. The POPIT plug is lightweight, easy to handle and effective in both RCP & Box Culverts.

www.popitplug.com

Call 215-752-8410 for FREE samples. POPIT Inc. The ONLY way to fill lift holes!



popitplug@verizon.net



WHAT IS CCUS?

Carbon Capture, Utilization and Storage (CCUS) is technology that will extract and sequester CO₂ from the chemical reaction that takes place in the kiln as cement is being produced. from the U.S. Department of Energy (DOE) – that are implementing pilot projects for carbon capture, utilization and storage (CCUS). This technology will extract and sequester CO_2 from the chemical reaction that takes place in the kiln as cement is being produced, the chemical fact of life that is responsible for more than 60% of emissions in the cement manufacturing process.

Positive steps have been taken in accelerating the development of CCUS technologies, most notably in Congress, where the 45Q tax credit has been enhanced. The tax credit incentivizes investments in carbon sequestration and reduces the financial risk companies assume when investing in early-stage CCUS projects. As already noted, the federal government through the DOE is making funds available for CCUS projects across a wide range of industries in which carbon emissions are hard to abate. Carbon capture is one of the four key pathways outlined in the department's Industrial Decarbonization Roadmap.

A crucial central cog in the drive toward a carbon neutral cement industry, with low-carbon products, is collaboration – not just in the cement industry itself but across the entire cement-concrete-construction value chain. A collective ambition toward carbon neutrality is vital if the processes and products outlined above are to reach commercialization. To that end, the Portland Cement Association, which represents the majority of U.S. cement manufacturers, released its Roadmap to Carbon Neutrality last year. The Roadmap outlines pathways for the entire value chain to reduce emissions.

Encouragingly, the industry is seeing greater demand for low-carbon materials that drives innovation at the top of the value chain along with regulatory approval at the state level for products such PLC, which will help reduce CO₂ emissions in the short term. In the future, concerted, collaborative efforts must be allied with innovation to maximize the benefits of technologies like CCUS to create an entirely carbon neutral industry producing cutting edge, low-carbon cement.

Biodegradable Form Releases

- Water Free
- Solvent Free
- Zero Vegetable Oils
- Exceptionally Clean Forms
- Exceptionally Smooth Surfaces

O

200 ml

150

100

00

Designed for All Mixes and Forms

The

- Environmentally and Worker Friendly
- Low Odor
- Low VOC Compliant
- Contains No Waxes or Silicones

STRONG Biodegradable Releases

877-868-5650 www.strongproductsllc.com

0

Choice is

Conflicting Codes

COMPANIES AND ENGINEERS NEED A STRATEGIC APPROACH WHEN JOB SPECIFICATIONS CAN CALL UPON MULTIPLE CODES, SOMETIMES FROM DIFFERENT STANDARD-SETTING ASSOCIATIONS



By Daryl Burns, P.E.

Daryl Burns, P.E., is a former NPCA director of codes and standards. He currently is a product engineer at Garden State Precast. A variety codes and specifications set the minimum standards for the structural design and manufacturing of precast concrete products, but what should precasters do when different codes have conflicting language?

First, start with a list of the major codes and standards commonly specified, such as this one:

- American Concrete Institute (ACI), ACI-318 Building Code Requirements for Structural Concrete
- American Concrete Institute (ACI), ACI-350 Code Requirements For Environmental Engineering Concrete Structures
- American Association of Highway and Transportation Officials (AASHTO), AASHTO 17th Edition 2002 Standard Specifications for Highway Bridges
- American Association of Highway and Transportation Officials (AASHTO), AASHTO LRFD Bridge Design Specifications
- The American Society for Testing and Materials (ASTM), Various manufacturing and design standard specifications

From there, rely on your experience, training and a little bit of common sense.

THE STRESS OF DESIGNING PRECAST CONCRETE

Sometimes, projects that have precast concrete specified in the plans reference conflicting codes to follow for the products' structural design. The inclusion of conflicting codes often causes stress, confusion and possible project delays.

This issue most often occurs when specifying engineers rely on standard or canned specifications for projects that reference everything be followed, leaving the design engineer to make assumptions.

But a thorough read of each code leads to, among other things, different:



- Load factors.
- Bar cover requirements.
- > Methods for computing the capacity of concrete members.
- Live loads.

So, what to do?

ERR ON THE SIDE OF MORE INFORMATION

If time allows, the first option always should be a request for information to the engineer of record to find out exactly which code to follow for the design and manufacture of the precast concrete products.

Keep in mind that it could take days or even weeks to get an answer, so it may not be the best option for some precast projects, such as when a contractor expects fast turnaround.

The second option is to look deeper into the project plans and review how everything fits together. The biggest clue as to what design code to follow is the live load the precast concrete products are specified to support. Knowing the required design live load determines the design code, because design codes have specific live loads within them that are not the same across all codes.

Often, there will be general notes on the same

Companies and engineers need a strategic approach when job specifications can call upon multiple codes, sometimes from different standard-setting associations.



project plan sheets as the precast products. Within these general notes, it is common to find the required design live load to design the precast products for.

For example, here is a list of design codes and the corresponding live loads within them:

- ACI Uniform live load given in pounds per square foot or kips per square foot.
- AASHTO 17th Edition 2002 H 15-44, H 20-44, HS 15-44, HS 20-44, HS 25, Alternate Military Loading
- AASHTO LRFD 2020 HL-93
- ▶ ASTM A-03(300psf), A-8, A-12, A-16

If a project has all the codes mentioned above referenced within the specifications and the precast concrete product plan sheet has a note near them saying they are required to support an HS 20-44 live load, it is a good bet that the AASHTO 17th Edition 2002 is the design code to follow. This assumption is made because the HS 20-44 truck live load only shows up within the AASHTO 17th Edition 2002 Standard Specification for Highway Bridges Design Code.

If time and information isn't in your favor, always choose the most conservative code and

If time and information isn't in your favor, always choose the most conservative code and design the product following it.

design the product following it. Yes, this could result in a small amount of conservatism in the design, but everyone knows that saving time is money, too. It also keeps the customer happy that things are moving along at a fairly quick pace.

WHAT SHOULD A SPECIFYING ENGINEER DO?

As a specifying engineer, be sure to provide plans and specifications specifically calling out what code to design the precast concrete products to. This ensures that the owner is getting a properly designed, quality product that will last for decades to come.

Some notable benefits of precast concrete are quality construction within a controlled environment, quick installation, financial savings and being a durable, resilient product.



A Culture of Recognition



By Shari Held

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

EMPLOYEE REWARDS FOR A JOB WELL DONE SHOULD GO DEEPER THAN A MONETARY PRIZE OR AN ANNUAL EVENT; DAILY DOSES OF THANKS AND PERKS GO A LONG WAY TOWARD KEEPING STAFF MOTIVATED

Motivated, engaged employees are more productive and more apt to stay on the job. That has been well-known for a long time.

Traditionally, the formula for keeping an employee satisfied was a good wage and an annual bonus. Not so, anymore.

Today's workforce responds to more immediate feedback, so recognition needs to be at the core of a company's culture.

In a study by Zippia.com, 37% of respondents said employee recognition is the No. 1 factor in motivation. Everything else pales by comparison. For example, only 7% ranked pay increases most important. This survey also found that strong employer recognition programs can reduce turnover rates by 31%. Savvy companies strive to build a culture where employees feel a strong connection to both leadership and each other. Smaller, more frequent rewards that impact a diversity of workers work alongside a more common compensation at year's end.

"We make sure everybody knows they're important, valuable and part of a team that has a common objective," said Leo Feuerstein, secretary/treasurer and operations manager for Western Precast Concrete. "That weighs into their decision as to whether they're going to stay or not."

Here are some innovative strategies that precast concrete companies are using to reward their employees.



What Motivates Employees?



Source: Zippia.com

FEEDING EMPLOYEES' DESIRE FOR RECOGNITION

Employee incentives can be big or small, formal or informal, frequent or annual. Using a variety of strategies is optimal, but the most important factor is that employers show their appreciation in ways that connect with employees' wants and needs.

When Shea Concrete President Greg Stratis visits one of Shea's plants, he makes sure to say hello to every worker, shakes their hands and engages in small talk. Last year, Shea's "Boot Truck" visited all four plants and gave each employee a free pair of work boots. During the summer months, the company arranges for food truck visits – everything from an ice cream truck to a fish taco truck – to provide a bit of fun and variety during the workday.

"We're always doing things like that, just to say thank you," Stratis said. "If someone enjoys coming to work and likes the atmosphere they're working in, it boosts their morale, and everyone around them feels better."

Based in Amesbury, Mass., Shea Concrete's annual picnic brings all 125 permanent and temporary employees and their families together for a cookout and outdoor activities. Employees also are compensated to attend events sponsored by outside professional organizations.

And, most importantly, the leadership team listens. When several employees suggested a company golf outing this year, Shea Concrete organized one. Each year, the 75

employees of El Paso, Texasbased Western Precast receive bilingual birthday cards from

the owners plus a \$25 check. Western Precast also provides catered lunches whenever the company meets its production or safety goals.

"Once you pay a really good wage and demonstrate you're an environment that treats each individual with respect, then these little incentive boosts throughout the year keep everybody on track and keep morale up," Feuerstein said.

The company's annual employee recognition luncheon recognizes every employee and typically features a catered meal and entertainment. Employees receive plaques denoting the number of years they've been with the company and a monetary gift.



Shea Concrete's Boot Truck

Tacos, burgers and hot dogs frequently are on the menu for plant cookouts at Locke Solutions in Houston. Recently, the company held a barbecue cookout and gave employees special T-shirts and hats.

Every weekly department meeting at Locke Solutions begins with employees giving a shoutout to others who have performed above and beyond, and this praise is distributed companywide. The company's Employee of the Month receives a personal day and a certificate, but the names of all nominees are announced, and their achievements complimented as well.

> "Any kind of recognition goes a long way," Locke Solutions President Asher

> > Fun, low-cost events for workers can include bring your dog to work day or a special company T-shirt to tie into a local team's success.



Kazmann, P.E., said. "If no one says anything, after a while an employee is going to say, 'What's the point? Why should I go the extra mile?' But they respond positively to getting recognized and having people thank them."

Sarasota, Fla.-based Atlantic TNG operates an onsite kitchen, nicknamed "The Garage," in honor of a past employee. Employees can purchase lunches there on a donation-only/honor system basis and chill out in a pleasant café-style area. No one goes hungry, even new employees who haven't yet received a paycheck. Every Wednesday, the café serves a hot meal to benefit a specific cause.

Food and special events are big winners with employees, but other options also are appreciated.

Atlantic TNG managers use T-shirts and gear to reward employees for a job well done or for working on Saturday. For the last three years, the company has used the Crew app to link everyone together. Employees who opt in – and 99% have – can recognize fellow employees with gold stars on a daily basis and wish them a happy birthday.

"If someone enjoys coming to work and likes the atmosphere they're working in, it boosts their morale, and everyone around them feels better."

- Greg Stratis, Shea Concrete

"Precasting is difficult work, especially for the guys who work outside," said Megan Kitchner, general manager and owner of Atlantic TNG. "It's hard for them to keep a positive attitude all the time. Giving daily accolades – a pat on the back and telling people they are doing a good job – is something we instill in our management team."

Being featured in company newsletters is another way to make employees feel good about themselves and who they work for. Locke Solutions' quarterly newsletter highlights the Employees of the Month, new hires, promotions and certifications.

Western Precast has published its quarterly newsletter for more than 22 years. Each issue features an employee on the cover. The goal is to give employees something they are proud to show to their families.

"I've found it has a lasting effect," Feuerstein said. "Many employees have told me they really value being honored and being recognized like this."

SHOW ME THE MONEY - AND PRIZES!

Bonuses of one form or another – annual, quarterly, holiday, production, profitability – are awarded by all four companies.

"Everybody wants a bonus," Kazmann said. "But that's fleeting. If employees don't feel good about where they're at, if they don't feel like people are paying attention to them or their ideas, I don't think they'll stick around very long."

Each month, Locke Solutions holds a drawing for everyone who completes a safety report. Prizes typically include coolers, gift cards and sporting event tickets. Raffles also acknowledge employees' efforts. In addition, the company hands out quarterly bonuses.

Western Precast awards annual cash bonuses based on the company's profitability. It also surprises a different team each month with gift certificates. Other drawings feature technology purchased from NPCA and an annual trip giveaway.

The company's incentive program uses \$25 gift cards to recognize employees who clocked in on time every day during the month. In the past, quarterly incentive prizes have included \$500 gift cards and flat-screen TVs.

Shea Concrete has so much work in the pipeline, it recently began implementing time-and-a-half bonuses for employees who work more than five days a week. Some job functions earn an additional bonus on top of that.

MAKING IT PERSONAL

Investing in employees' physical and mental health shows a company's concern for its employees' welfare. According to a 2022 Metlife report, holistically healthy employees are 74% more likely to be satisfied with their job and 53% more likely to be productive.

Shea Concrete's new headquarters features a full gym, and the company's employee assistance program offers free counseling visits. The company realizes the impact a single employee's mental state has on overall employee morale.

"If a person has a miserable life at home, they come to work miserable," Stratis said. "And it really brings down everyone working around them."

Rather than terminate that person, Shea Concrete chooses to help.

Western Precast reimburses employees gym memberships at 90% and reimburses employees for counseling visits. Western Precast also offers maternity leave for both mothers and fathers.

Providing employees with opportunities to help others increases their sense of value, which makes

Holistically Healthy Employees are:



Source: Metlife



them more productive and more apt stay on the job.

Atlantic TNG creates and sells T-shirts that support specific causes. For example, the company recently offered a breast cancer awareness shirt and another shirt benefiting an employee who was hospitalized after a serious accident. Donations from the company's Wednesday hot lunches also go toward fundraising.

"Fundraising has been really strong here for the past three to five years," Kitchner said. "And we get better at it every year."

Finally, investing in an employee's education and certifications is a sure-fire way to demonstrate that they are valued. Many companies pick up the tab for educational classes, and some offer bonuses on top of expenses. It's an honor to be selected to participate in additional training whether a skills class, leadership class or earning an accreditation or certification.

For example, Locke Solutions selects two employees per year to attend NPCA's Master Precaster program and plans to send an employee to the Leadership NPCA program each year. Currently, the company is paying a private teacher to help two workers learn English.

"This one is huge," Kazmann said. "When we put the money down to help employees develop personally and professionally by sending them to a training program, it's proof of their value. And that's a huge morale booster."







IMPROVE YOURS SINCE 1970.

800. 220. 4857 | www.painsert.com

IDENTIFYING A COST-EFFECTIVE Energy Management Strategy



By Dan Forgacs

Dan Forgacs is the vice president of market analytics and intelligence at APPI.

ISTOCKPHOTO.COM

Rising costs were a pain point in 2022 for most businesses and organizations. Energy costs are no exception with natural gas and electricity prices experiencing unprecedented market volatility.

A variety of factors, both nationally and internationally, are contributing to high electricity and natural gas prices. While many factors are out of a company's immediate control, a closer look at energy management strategies can identify opportunities to reduce energy usage and energy costs.

CREATING BUDGET CERTAINTY ON THE PROCUREMENT PROCESS

Start with the basics: deregulation. Organizations in deregulated energy markets have the flexibility to create energy management strategies that align with community goals, budgets and fiscal calendars.

In a deregulated electricity market, the utility still owns all infrastructure and delivers the energy, but individuals can choose to shop around and buy electricity or natural gas from a licensed energy retailer that does business in the market. Competitive suppliers offer options to tailor energy buying strategy based on personal or company goals, and the utility is obligated to provide the same level of service to all customers if an outage occurs.

There are numerous benefits to energy deregulation and procurement, such as negotiating lower prices for electricity and natural gas, peace of mind provided with budget certainty and a fixed, all-in pricing.

Still, deregulation sometimes can lead to confusion.

WHEN TO TAKE ACTION

A common misconception centers around the timing of when energy supply agreements can be executed. Many executives believe they must wait until just before their current contract expires to decide what to do next. Actually, the process can start much earlier, in fact at any time during their current contract term.

Favorable electricity price trends greatly determine when business leaders evaluate prices and suppliers as well as when to go the route of a consultant. A core component of

APPI Energy is member of NPCA's Affinity Program, which provides access to members-only benefits. APPI provides savings on electricity and natural gas to its customers.

Learn more at: Precast.org/ plant-resources/affinityprogram. risk management is mitigating exposure to volatile energy prices that can cause budget uncertainty and operating cost increases.

The question is: Do you have adequate time and knowledge to track energy price trends and compare suppliers? For an organization that consumes 1 million kilowatt hours of electricity each year, the cost difference between supplier price quotes could be several thousand dollars annually.

An integral component of an energy management strategy is to

seek consultation regarding market timing, the procurement process, suppliers and supply contracts. Leaders that are proactive have a competitive advantage when addressing their energy supply needs. They are positioned to make more informed decisions that decrease costs and provide improved budget planning and forecasting.

MAKE AN ENERGY MANAGEMENT STRATEGY A PRIORITY

Energy is one of the biggest cost factors of a business, large or small, but it not always is a top priority. Prioritizing how an organization approaches energy management and spending are the first steps. Just as important is talking about energy strategy and executing on smarter strategies.

Start by exploring current energy costs, demands, objectives and issues to make informed decisions about how to move forward. No two businesses are the same, and no two strategies are alike, so think in terms of what works for budgetary goals and objectives.

Partnering with a trusted source is crucial, especially for companies without the bandwidth or expertise to shop a wide variety of suppliers. A comprehensive look at the organization's complete energy profile helps identity the right steps to take in not only reducing energy costs but also improving energy efficiency and sustainability.

EVALUATING CURRENT ENERGY NEEDS

With that in mind, here are six simple questions to determine if a company is spending too much on energy or is not taking advantage of opportunities available to improve sustainability and resiliency.

- Do you evaluate your current energy supply contracts, building usage profiles, historical tariffs and market data?
- Have power outages cost you in production losses, or is your power unreliable?
- Have you explored generating your own power with technologies such as solar or combined heat and power (CHP)?
- Do you participate in a demand response program to receive monetary compensation for curtailment during peak times?
- > Are your stakeholders encouraging or demanding a greener footprint?
- Does your organization have old, inefficient systems and equipment that could be upgraded to improve operations and concurrently save on energy usage and costs? Examples include inefficient HVAC systems, old air compressors with potential leaks or older lighting.

If any of these sound familiar, there is opportunity to improve current energy management strategy by reducing overall energy demand while also improving upon resiliency, efficiency and sustainability. Paired with a strategic electricity and/or natural gas procurement strategy, energy efficiency projects and demand-side management carry a multitude of operational, financial and environmental benefits that impact both the short and long term.

Safety: The Most Critical Investment



By Mason Nichols

Mason Nichols is a Grand Rapids, Mich.-based writer and editor who has covered the precast concrete industry since 2013. A CONSISTENT, PROACTIVE APPROACH TO SAFETY OFFERS THE BEST OPPORTUNITY TO PROTECT EMPLOYEES WHILE SAVING TIME AND MONEY IN THE LONG RUN



Developing and sustaining a strong safety program requires a concerted investment of time and money.

A culture of safety is like any other asset – a series of small steps that lead to a long term payoff resulting in increased protection for employees and facilities against potential accidents and the associated costs that come with them.

At its most basic level, a precast concrete facility safety program is designed to prevent injuries, illnesses and deaths. Safety specialists take that foundation then look to build further out when constructing a plantwide plan.

And every brush stroke along the way paints the big picture that both workers and management are looking for.

OSHA CORE ELEMENTS

The Occupational Safety and Health Administration (OSHA) notes seven core elements that should be addressed in every safety plan:

- Management leadership
- Worker participation
- Hazard identification and assessment
- Hazard prevention and control
- Education and training
- Program evaluation and improvement
- Communication and coordination for employers, contractors and staffing agencies

Wendy Potashnik, executive vice president at USA Precast Concrete in Canal Fulton, Ohio, takes those seven points to heart, and she uses them to sculpt the safety efforts at her plant.

USA Precast Concrete is relatively new in industry terms. The plant has been in operation for less than a decade. During that time, Potashnik has been working diligently to bolster the program with OSHA's core elements in mind.

She facilitates this by using a wide array of – mostly free – resources that can be leveraged to accomplish her safety goals, including:

SAFETY CONSULTATIONS. OSHA, along with state-specific safety organizations and governing bodies, visit plants and assess written safety plans along with daily efforts. From this analysis, recommendations are made for potential areas of improvement. Citations and formal reports are not generated as part of this process.

- SPECIALTY PROGRAMS. Local agencies may provide training opportunities on specific safety topics. At USA Precast Concrete, Potashnik invited a nurse to the plant for the "Stop the Bleed" program, which focused on methods for treating more severe injuries. The plant received special tourniquet equipment as part of the training.
- NPCA TOOLS. Bimonthly safety training materials, important updates from OSHA and an extensive series of videos covering best practices all are available at precast.org/ safety.

In addition, Potashnik visits fellow NPCA members and speaks with industry peers to enhance her program. Additional research leads to more information, which ultimately results in a wide-reaching effort that covers all of a company's critical areas.

"My mindset has always been that it's imperative to be proactive, not reactive, when evaluating safety protocols."

- Wendy Potashnik, USA Precast Concrete

GENERATING AND SUSTAINING BUY-IN

With a solid base of general information in hand, the next step is fitting company-specific needs. No one knows a plant better than the teams that work there, so tap into employees' experiences for suggestions as a resource on areas to address. This also builds buy-in from staff members and reinforces the importance of safety while creating a feedback loop that helps a company improve through time.

For more than six years, Thomas Jimeno has been improving and refining Wilbert Precast's safety program. As occupational safety and health manager at the Spokane, Wash., facility, the changes he has helped implement have resulted in positive gains for his team and the plant.

Jimeno said dedicating the time, energy and financial resources needed to build a strong, effective safety plan must come from the top, but success cannot be sustained without support from the rest of the company.

"When I took over at Wilbert Precast, our safety program was on paper only," he said. "As such, the culture of safety wasn't there. While our owners and executive team were onboard, I had to work with several other members of the team, including branch managers and those on the production floor, to stress the importance of what we were doing."

A safety program cannot only exist on paper.

Over time, Jimeno has helped team members think about situations from different perspectives. During one of Wilbert Precast's company meetings, he asked employees a simple question: "What can you do with an extra \$1,000 in your pocket?"

In Washington, employees are responsible for paying a portion of their company's insurance premiums, which are determined based on that company's safety performance and record.

"I gave everyone an example of one of our worst years where we had a poor safety rating and compared it to one of our better years," Jimeno said. "Then I showed them just how better performance puts money back in their pockets."

These dedicated efforts have resulted in noticeable improvements. Wilbert Precast has gone from 25 claims per year to about half that. This resulted in Wilbert Precast receiving refunds on premiums to the tune of thousands of dollars in savings.

THE POWER OF PROACTIVE

Precast facility safety covers a wide range of topics and situations. As a company grows, so must a safety program. This necessitates a consistent and persistent care for your plan, Potashnik said.

"My mindset has always been that it's imperative to be proactive, not reactive, when evaluating safety protocols," she said. "We've known companies that have almost gone out of business because plant safety procedures didn't properly protect the employee or the company, and accidents occurred. That really drove home how important it is to be proactive."

OSHA's Kimberly Darby agrees.

"Precast concrete plant owners and managers must recognize that finding and fixing hazards before they cause injury or illness is more effective than addressing problems after a worker is injured or becomes sick," said Darby, a member of OSHA's national communications team. "Safety and health management systems help organizations prevent workplace injuries and illnesses, improve compliance with laws and regulations, reduce costs, engage workers, enhance social responsibility, increase productivity and boost overall business operations."

To achieve success, allocation of time and resources is critical. There are several steps that you can take to make this happen:

- PRIORITIZE SAFETY IN EVERY SITUATION. Tell employees to find and fix any hazards that could cause injury or illness. Emphasize that going home safely is the way the company does business.
- LEAD BY EXAMPLE. This means dedication to safe operations, including the appropriate investment of time and money.
- PROVIDE TRAINING. Use all resources available to provide consistent education on safety-related topics.
- CONDUCT REGULAR INSPECTIONS. Inspect the plant with workers and ask them to identify any activity, equipment or material that is a cause for concern. Use checklists and other resources to identify and address these issues.
- FORMULATE A SAFETY COMMITTEE. Empower team members with a passion for safety to gather as a group and identify additional measures that can be put into place to enhance the program.

Committing to some of the ideas will gain an entire team's trust and respect. This helps with overall buy-in while generating a safety culture that is defined by being proactive and addressing issues before they become accidents or injuries.

ALWAYS EVOLVING

The goal for every precast concrete plant should be for team members to head home to their families in the same condition that they arrived for the shift. And in the end, there's no better asset to invest in than people.

Safety is a living, breathing effort that requires constant maintenance. Dedicating appropriate time and resources prevent critical injuries while communicating a message of care and compassion to the team.

"The thing about safety is that you never arrive," Jimeno said. "It requires a continuous energy and a commitment from everyone on your team to never possess the attitude of 'We are good enough."

Proper personal protection equipment is a minimal-cost investment that pays off immediately in safeguarding employees when working around wet concrete, rebar and other common items inside a precast concrete facility.



THE ALL NEW UCKERBIT T-644

THE ULTIMATE, SMART, 6-YARD, CONCRETE TRANSPORT VEHICLE

INTEGRATED HOPPER SPLASH DEFLECTOR

2 FEET HIGHER REACH AUGER	ENCLOSED, CLIMATE-CONTROLLED CAB	JCB TIER 4 ENGINE
1	RPM ON DEMAND FOR FUEL ECONOMY	C:A
	CENTERLES	BACKUP CAMERA
		CREEP MODE

TRACTION CONTROL

The new **smart** T-644 vehicle is equipped with the latest CAN-based machine control technology resulting in greater operator control, increased safety, and diagnostic capabilities.



TUCKERBILT.COM 352-787-3157 P.O Box 492810 • Leesburg, FL





E.C. BABBERT, INC. EST. 1960



By Joe Frollo

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

A Buckeye Brother Act Nested on the southeas

Chuck (left) and Ron Babbert lead a staff of about 75 people at the E.C. Babbert facilities in Canal Winchester and Lancaster, Ohio. The pair have been working for the company since high school and continue their father's legacy of stability and success.

SECOND-GENERATION PRECASTERS CHUCK AND RON BABBERT HAVE CARVED OUT THEIR NICHE IN THE CENTRAL OHIO MARKET Nestled on the southeast side of Columbus, Ohio, E.C. Babbert Inc. has been doing its thing for more than 60 years.

For Chuck and Ron Babbert, second-generation precast concrete producers, that means waking up early, working hard alongside a dedicated staff, laughing at and with each other and manufacturing products for projects found throughout central Ohio.

The Babberts have built a solid niche in residential and municipal underground products, something Chuck, Ron and their team work daily to maintain. They take pride in their work, and it shows with the repeat customers that come back to them year after year. They also take pride in their relationship with NPCA. As the president of sales, Chuck has been part of nine NPCA committees, subcommittees or task forces. He served on the Board of Directors and was the Robert E. Yoakum Award winner in 2015, NPCA's top annual award. His father, E.C., also won the Yoakum in 1977. As president of production, Ron makes sure Babberts' two facilities operate to NPCA's top standards.

NPCA members got an up-close look at the Babbert operation when it hosted The Precast Show 2023 Plant Tours. Chuck, Ron and the staff spent the first two months of the year "putting some spit and polish on the place," according to Chuck, but really, what's a little aggregate dust between friends?

"We put out a good product, and we take pride in what we do," Chuck said. "It's why my father first got into business for himself way back when, and it's why we come to work every morning now.

"It's exciting to have a couple hundred precasters walking around and asking questions about how we do things. Kind of pumps us up a little around the chest. We're proud to be precasters, and we are proud to show how we do things."

HANG OUT THEIR SHINGLE

E.C. Babbert Inc. was founded in 1960 with a truck and about \$80 in savings. From those humble beginnings, it has since grown to include two manufacturing facilities covering 42 acres 15 miles apart.

"My father was working as a plumber and one day he decided he was finished working for someone else and instead wanted to go out on his own," Chuck said. "He gave his notice, and they told him he could leave that day. So he got home and told my mom, 'Well, we're officially in business."

With Bonnie serving as secretary, treasurer, scheduler and business manager, E.C. went out each day to find and fill orders.

The Babberts began by working with wells and water systems but also installing septic tanks, pumps and residential water softeners on the east side of Columbus. City water and sewer lines were starting to make their way into the area, so private housing jobs became the company's bread and butter.

In 1963, E.C. Babbert purchased his first monorail boom truck. He worked with three local precast concrete manufacturers that produced the tanks of the ATU systems that Babbert installed.

"That approach eventually took off to where he got busier," Chuck said. "Eventually, my father got so busy that he hired another truck and a few fellows to run the wells and water."

Eventually, E.C. got out of the plumbing side of the business entirely, giving it over to the workers under his employ.

E.C. saw more future in hauling and

E.C. Babbert made the decision to install a batch plant onsite around 1970, offering a turning point for the company. Consequent upgrades have allowed both E.C. Babbert facilities to expand their product lines.

MX-8

E.C. Babbert trucks are out on the road every morning from before the sun rises until the job is done, delivering high-quality precast products to central Ohio work sites.

installing precast concrete tanks constructed by others. Soon, though, history would repeat itself and the Babberts slowly stopped relying on others and instead began producing the products they installed.

A D.I.Y. ATTITUDE

E.C. Babbert spent many hours hauling and installing precast concrete tanks in Columbus and the eight surrounding counties. These long days often turned into longer nights as after the manual work was done, he shifted into sales mode – typically with Chuck and Ron in tow.

"He was burning the candles at both ends to put it mildly," Chuck said. "I don't know if he thought of it or if someone suggested it to him, but

the idea of making his own tanks lit a fire within him. He was going to make that work."

In 1968, the Babberts bought a house and 15 acres of land out on Route 33 in Canal Winchester with easy access to the highway. The company purchased ready-mix concrete to fill its forms, but once again, that didn't last long. E.C. wanted complete quality control from pour to install.

Soon, with a mobile batch plant on site, E.C. Babbert finally was start-to-finish producing the products that it also installed.

"We eventually got good at making the stuff we needed," Ron said. "We'd buy our forms at first from other people, but we've found that a lot of jobs don't fit squarely into the one-size-fits-all approach."

By outsourcing specialty forms and tweaking the ones they already had, the Babberts rose to every challenge brought to them. The father and sons were cut from the same cloth in that they relished finding the answers as much as anything else.

"I can't count how many times we'd have a job where we say, 'How the heck are we going to do that?'" Ron said. "Then, we'd create something cool and different, and all of a sudden we can replicate it for others."



BEFORE THE ROOSTER CROWS

Ron rises between 3 and 4 a.m. every workday to open the Canal Winchester facility. Chuck typically arrives an hour after his younger brother, though still long before the sun is up.

Chuck and Ron started working for their father while in high school. Along with some pouring and installing, they would recruit friends to gather patio stones, curb stops and small landscaping products that they then transported to garden outlets.

"We all played sports, and we all were good students, but I can't tell you the amount of hours my buddies and I spent at the plant working nights and weekends," Chuck said. "We'd come in, load the truck, take everything out then come back and do the same thing again. It was hard work, but we made good money for our age."

That work ethic remains. With about 75 employees between the two facilities, it's not uncommon for Chuck and Ron to chip in where needed because of vacations and sick days. Chuck has filled in at the reception desk and isn't shy about getting his hands dirty, while Ron regularly drives the water truck through the yard to spray down the dust that builds up.

"They take a lot of pride in the work," said Babbert Safety Coordinator Justin Conrad, who has been with the company for 20 years. "A lot of people here do multiple jobs when others are out or on vacation. It is not unusual to see Chuck and Ron filling in at dispatcher, handling walk-ins or estimating.

"They set the tone for the camaraderie we feel around here. They let us do our jobs and go home to our families and kids. That's important to why people like working here."





Ron Babbert arrives to the Canal Winchester facility around 4:30 a.m. every morning, ensuring that the day's schedule is ready to go.

FROM RESIDENTIAL TO COMMERCIAL TO MUNICIPAL

The company's first big break came in 1975 as the result of hard work and a touch of luck.

The Babberts' focus on wastewater packages for residential jobs slowly grew to include some commercial work, including small shopping centers.

With a solid foothold and increased work orders, the Babberts soon found themselves with an opportunity to expand into municipal projects thanks to a technological glitch. The Babbert trucks just happened to share a radio frequency with a local contractor who was looking to subcontract some precast manholes for the City of Columbus.

"That pretty much opened the floodgates for us," Chuck said. "We purchased some used forms, set up the manpower and off we went."

There was a slight hiccup early on with the seals Babbert employed within its manhole design, but a relationship with fellow NPCA member Press-Seal helped smooth that out.

With sanitary contracts in hand, next came stormwater systems that connected to city utilities. All of a sudden – at least to the young Babbert brothers – they were full-steam ahead in the underground business just as the city was moving its preference from cast-in-place to precast.

"From there, things started moving a lot faster," Chuck said. "We are now 90 percent underground products with a little architectural. Anything precast that digs down, we can go with it."

NO BARRIER TO SUCCESS

With the company now a known entity around the city, the Babberts took on a large aboveground job that has stood the test of time.

Hotel owner and real estate developer Jim Trueman headed a group that brought auto racing to Ohio's capital city, and in 1985 when the Columbus Ford Dealers 500 needed barriers to set along the track, they turned to Babbert.

"I'll be honest, we had little to no experience in making barriers, but we had a lot more







"Everything moves faster these days, and projects seem to get bigger and bigger then move down the tracks at quicker paces than ever. But in the end, it is precast work, and that's what we know how to do well."

– Chuck Babbert, E.C. Babbert Inc.

experience building precast than the other bidders," Chuck said. "That's what won us the bid in the end."

Like many things in the sports world, the job was slow to kick off then fast-tracked as deadlines approached. To prepare for an around-the-clock workforce, the Babberts purchased a boiler to steam the different types of barriers that were required.

"That was the first time we ever went to three shifts," Chuck said. "But when they started blocking off the streets and installing the barriers that we built, it was neat to see."

The Columbus 500 was short-lived because of Trueman's death, but the Babbert barriers did not go to waste. The Truemans also owned the Mid-Ohio Sports Car Course in Lexington, Ohio, and Trueman's widow had the barriers shipped 60 miles north, where more than 1,000 feet of barriers are still in use today, including Turn 5 and the last half of the back straightaway.

"They certainly got – and are still getting – their money out of it," Chuck said. "It's a testament to precast concrete that something we built in the '70s is still going strong now nearly 45 years later."

THE BEST IS YET TO COME

With 2.1 million permanent residents, Columbus is the 14th largest metropolitan area and one of the fastest growing cities in the United States. Amazon, Google, Intel and Facebook all have major facilities there, so opportunities are growing for E.C. Babbert and other industries in and around the area.

Between large private projects and billions of dollars expected to improve Ohio's infrastructure over the next five years, Chuck and Ron are anticipating a full workload for the foreseeable future.

One project involves a sanitary system where the base alone will weigh 55,000 pounds with 18-inch walls. The work will involve securing an outside gantry crane during Ohio's snowiest months.

It is a project the Babberts have been training their whole lives for. The plan is set. The materials are ready. All that is to come is pour and install.

"Everything moves faster these days, and projects seem to get bigger and bigger then move down the tracks at quicker paces than ever," Chuck said. "But in the end, it is precast work, and that's what we know how to do well."

Industry Influencer





EXECUTIVE VICE PRESIDENT OF SALES, AFINITAS FORMING SYSTEMS DIVISION

INDUSTRY INFLUENCERS IS A QUARTERLY SERIES IN PRECAST TODAY MAGAZINE IN WHICH WE TALK WITH PEOPLE WHO ARE LOOKED TO FOR GUIDANCE AND ADVICE BY NPCA MEMBERS ACROSS GENERATIONS.



By Heather Bremer

Heather Bremer is the digital content director at NPCA.

Photos courtesy of Afinitas

Q. WHAT IS YOUR CURRENT ROLE IN THE INDUSTRY?

A. I'm the executive vice president of sales for the Forming Systems Division of Afinitas. And since Oct. 1, my responsibilities are special projects, largely focusing on automation working with Weckenmann of Germany, for whom we are the manufacturer's representative in the United States and Canada. But that doesn't preclude possibly other special projects that might develop again in the U.S. and Canada.

Q. THE COONS FAMILY HAS A LONG HISTORY IN THE PRECAST INDUSTRY AND NPCA. WHAT CAN YOU SHARE ABOUT THE EARLY DAYS OF YOUR PARENTS' COMPANY AND THEIR INVOLVEMENT IN NPCA?

A. My parents bought what was then called the RL Spillman Company, effective Jan. 1, 1958. My father came from a retailing background. Although pre-World War 2, he had a three-month engineering education. My mother majored in math and physics and actually was a physicist before she married and became a mother and worked with my father in the business. So, I remember discussions around our kitchen table, beginning in the early '60s with other people who became founders of NPCA, particularly with Robert and Jean Yoakum. My parents were among the co-founders of NPCA, and Spillman, celebrating its 75th anniversary in 2023, was one of 41 charter companies.

Q. HOW DID YOU BECOME INVOLVED IN THE FAMILY BUSINESS? WAS IT SIMPLY FOLLOWING IN YOUR FATHER'S FOOTSTEPS, OR DID YOU DISCOVER A REAL INTEREST IN THE INDUSTRY?

A. I did OK, or better than OK, in math and sciences in high school, and attended a summer



camp for two weeks at Coons Family, Union College between my circa 1959 sophomore and junior years, which was called Junior Engineers and Scientists Summer Institute. General Electric was one of the sponsors. We toured the GE research facility, and, at that point, I made the decision that I was going to get an engineering degree.

I would have been 15 at the time and went on to get a degree in civil engineering, majoring in structures, graduating from the University of Pennsylvania in 1972. I had taken the EIT (Engineer in Training) tests when I was in senior, so I got my EIT certificate and my graduation certificate on the same day. So I came into the family business in May 1972 full-time, having worked many summers at the company.

My father (William) passed away when I was a senior in college in the fall of 1971. So, my mother was running the business. At that point, I was working directly for her. Then she passed away in January of '78, and I became the principal owner and president, what we now call CEO.

I made the decision to go to college to train in the business. I took courses in both steel and concrete design, prestress design while I was in college. So, I clearly had the intention to prepare to be in the industry and then went forward with that plan.

Q. WHEN YOU TOOK OVER THE BUSINESS, HOW DOES YOUR CAREER EVOLVE FROM THERE?

A. Well, it was a family business. My brothers and I shared ownership. They chose not to become active participants. And so I, over the course of the early '80s, purchased their shares. I became the sole owner.

Spillman had been a standard form fabricator and supplier. We had a catalogue that had grown to 48 pages. At one point, it was considered the SEARS catalog of the concrete industry, and I saw an opportunity for us to branch into custom forms to get into both larger precast forms and prestress forms. I began to hire engineers and sales staff to promote that. So, we moved from standard



forms that were off the shelves, that were mail order to custom forming, beginning in the mid-70s. I would say we were fully transitioned in that by the early '80s. We went from basically making small forms to making forms as big as 40 or 50 or 60 feet long.

Q. SPILLMAN COMPANY RECENTLY BECAME PART OF AFINITAS. WHAT PROMPTED YOU TO TAKE THAT STEP?

A. We have three children. Our son has his own venture capital private equity firm. Our youngest daughter is a teacher in New Haven. Our other daughter lives in Columbus and worked for the company for a couple of years but decided it wasn't something that she wanted to do fulltime. So I sold out to Afinitas on Oct. 1, 2018. I have a five-year contract with them, which will expire Sept. 30 next year.

Q. WHAT KIND OF CHALLENGES DO YOU SEE AHEAD FOR THE INDUSTRY?

A. There has been some consolidation of the industry over the past 20 or 25 years, most notably on the precast side related to Oldcastle, which has purchased 70-some firms. I think there's a real opportunity for privately held firms to continue to meet the demands of the industry and to thrive meeting the customer demands.

The flip side of that is labor has become a significant issue for companies across the U.S. and Canada. And I think it's going to take a certain amount of significant capital investment and automation for companies in certain markets to survive. Which basically means the capital requirements in our industry are likely to grow over time, not get smaller.

The No. 1 question that I get from my colleagues when we sit down face-to-face with a customer: "What can you do to assist me to reduce the amount of labor content in the products I'm producing today and the ones that I want to produce the future?"

My work today, in terms of special projects, is all focused on process improvement and automation. Our association is historically multigeneration, and whether the next generation or the generations that are coming up now are going to want to work in industry and the businesses remains to be seen.

Q. WHAT KIND OF OPPORTUNITIES ARE WAITING FOR INDUSTRY IN THE NEXT FEW YEARS?

A. The reason the precast industry has grown over the past 50-plus years is precast continues to take a greater share of the concrete construction dollar, and it takes it away from cast-in-place concrete. So, those producers that have been most successful are able to look at a project that may or may not have been designed in cast-in-place and converted it. We as an industry have done a terrible job getting specs written to precast as the prime versus the alternative. It is still incumbent upon the individual producer to do most of that legwork. When they do that, they



E.C. Babbert and Ted Coons, circa 1974 -



open up a huge market.

It's harder and harder for their customers to do site-cast work. I've read any number of stories in a given month where a producer is promoting and acknowledging the fact that they've got this big structure that they converted and they're delivering to one side or another. And the amount of powder cement that the industry uses today is probably at least two, maybe three, times what it was in the '60s. It'll probably go up another 50% the next 10 years. And so producers have to get smarter about how they use their available production labor, but they're just increasing opportunities to convert what has historically been cast-on-site to factory-made-under-quality-conditions precast.

Q. YOU'VE BEEN GOING TO THE PRECAST SHOW SINCE 1973. WHAT WOULD YOU TELL PEOPLE IS THE BENEFIT OF GOING TO THE PRECAST SHOW AND BEING ON THE TRADE SHOW FLOOR?

A. The No. 1 value of attending The Precast Show beyond seeing what's on

Ted Coons, The Precast Show

the show floor is the networking that occurs. The NPCA staff are careful to pick sites that the exhibitors want to go to and to provide for networking opportunities – which translates, in NPCA terms, to how big is the bar? Literally!

Being a 50-year observer, we're now on the third generation of owneroperators. And that hasn't changed the preferred beverage – it's still beer.

I've planned events, and there are certain things that are routinely done

now that are no different than what we did 25 or 30 years ago. When an event opens, a social event opens. The staff makes sure that an attendee can get a drink in one hand and a bite to eat in the other hand in the first five minutes.

I think we always have a good mix of exhibitors at The Precast Show. Typically, somewhere between 5% and 10% are new to the show. That's important, but the networking part of it is really the greater part of it.

Q. YOU WON THE YOAKUM AWARD IN 1988, TWO DECADES AFTER THE YOAKUMS WERE SEATED AROUND YOUR KITCHEN TABLE WITH YOUR PARENTS. WHAT IS YOUR ROLE AS THE SENIOR ACTIVE WINNER?

A. When I chair the (Yoakum Award) committee as the senior and we have a new recipient, I have an introductory speech. I happen to have talked to (2022 winner) Lisa Roache yesterday and congratulated her and gave her a synopsis of what is happening when we get to Columbus. But of the people in the room today, I'm the only one that knew Bob Yoakum personally. And sometimes we get to a discussion of a candidate, and it becomes incumbent upon me to say, "Yeah, I don't know whether this person does or doesn't match the kind of ideals that Bob Yoakum would have espoused."

So, I'm the current link to those early days.

Q. WHAT IS THE LEGACY YOU HOPE TO LEAVE WITH THE INDUSTRY?

A. I was fortunate to be able to give back early and continuously. One of the unique things about NPCA is the open relationship between Producers and Associates. I want people to have mutual respect. I mean, we all have business interests to be involved in NPCA. But I would say the majority of my personal friendships today are people who I have worked with and been around on both the associate and producer side. And I would hope that that would continue.

That you have to support NPCA, you have to support ASCM and do those things that help move the industry as a whole forward and then do what you can to get your share of that but not the other way around. Not be interested in what you could do first, but if the industry moves forward, then you and your company and your associates will move forward with it. And to bring young people in and to mentor them.

> Tom Vildibill and Ted Coons, circa 1992



CUSTOM DESIGNS @ Standard Prices



BATCH PLANT MANUFACTURERS: Precast, Pipe, Prestressed, Ready Mix, Paver, Block Plants and Others • MIXERS: Planetary, Twin Shaft RETROFITTING EXISTING PLANTS • BATCHING AUTOMATION • CEMENT SILOS AND SCREWS DUST COLLECTION SYSTEMS: Silo Top Dust Collectors, Central Dust Collection Systems, Anti-overfill Systems CONVEYOR SYSTEMS: For all Plants • INSTALLATION SERVICES: New or Existing Plants PLANT COMPONENTS: Hot Water Heaters, Mixer Components for many Mixers, Replacement Dust Collector Bags and Cartridges, Water Meter and Accessories, Agg Bin Gates, Butterfly Valves and Accessories, Screw Conveyors, Solenoids, Belt Scrapers, Conveyor Components, Vinyl and Gum Rubber Boots • AND MORE

Office: 540.989.1281 Fax: 540.989.1285

W. P. HILTS & COMPANY Roanoke, Virginia Toll Free: 1.800.227.6798 Website: www.wphilts.com

Precast Shines at Premiere North Carolina Beach Club



PHOTO COURTESY OF CORAL BAY CLUB

By Bridget McCrea

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.

SITUATED ON AN ENVIRONMENTALLY SENSITIVE STRIP OF COASTLINE IN NORTH CAROLINA, CORAL BAY CLUB UPGRADES AND MODERNIZES ITS AGING WASTEWATER INFRASTRUCTURE IN ORDER TO ACCOMMODATE MEMBERSHIP GROWTH

Focused on providing top-tier services and facilities for its roughly 600 members, Coral Bay Club is a private, member-owned facility where people go to play tennis, sweat it out in a group exercise class, enjoy Sunday brunch and socialize in an inviting setting.

With a prime location on Atlantic Beach, N.C., the facility is everything an oceanfront country club is imagined to be.

Established in 1958, Coral Bay Club is managing many of the typical challenges for aging facilities. Physical structures deteriorate with age and can't always keep up as the organizations that rely on them grow, expand and modernize. Of particular concern for Coral Bay Club was its wastewater infrastructure, which was put in place more than 60 years ago.

That aging infrastructure prevented the organization from increasing its membership. In 2019, the organization decided it was time for an upgrade.

"The club wanted to add about 100 new members, but in order to do so it had to upgrade its existing wastewater system," said Michael Clayton, sales manager at AQWA, a wastewater solution provider in Wilson, N.C.

The existing infrastructure comprised a "hodgepodge of tanks, terracotta lines and a drain field," Clayton said. To add that many new members, the organization had to be able to accommodate a substantial increase in the permitted daily flow.



"Some of the project involved bringing the aging infrastructure up to speed," Clayton said, "and the other portion focused on expanding the system in order to allow the membership increase."

To resolve these issues, AQWA worked alongside NPCA member Shoaf Precast and others to fulfill the needs.

MANAGING THE INTRICACIES OF COASTAL WORK

An Orenco Systems dealer, AQWA operates as a consultant to developers, engineers, soil classifiers and other stakeholders that need help using the AdvanTex® treatment equipment that the company installed for them. The system is a compact and efficient recirculating packed-bed filter.

For the Coral Bay Club project, AQWA worked with the project engineering team to determine the size of the tanks, the treatment system and to "work out the practical details" of the overall project, according to Clayton. Shoaf Precast manufactured and installed a series of tanks to support wasterwater system upgrades at Coral Bay Club in North Carolina.

"We love Shoaf Precast's tanks, and particularly their very large products. We use them a lot in our commercial and large community systems."

- Michael Clayton, AQUA

The company also designed and provided the equipment for the subsurface irrigation drain field at the commercial facility, which includes a kitchen and that often hosts large events, including weddings and graduation parties. To accommodate those events, Coral Bay Club's new wastewater



THE INNOVATIVE LEADER IN FORMWORK TECHNOLOGY

RATEC is trendsetter in the development and production of magnetic formwork technology and intelligent forms solutions for an efficient precast concrete production.

MEET THE BETTER IDEAS!

The New Product Catalog. Order your free copy here:





EXCLUSIVE NORTH-AMERICAN SALES REPRESENTATIVE FOR



RATEC America Corporation Phone +1-727-363-7732 infous@ratec.org www.ratec.org





critical consideration on this project, which was situated in an environmentally sensitive coastal area. As preserving these natural resources becomes a higher priority, any work performed or products installed there must be environmentally friendly.

For this project, the tanks would have to be installed near the club's building, where the bottom of the excavated hole would be several feet below sea level. This was one of several reasons why precast concrete was selected for the project.

"Wherever the tide is, that's where the water is in your tank excavation," Clayton

The bottom of these tanks are below sea level, adding to the project's complexities.

said. "So just as fast as you can pump the water out, it wants to come back in and fill that hole up. Needless to say, the project involved a lot of dewatering."

The arrival of the precast tanks had to be timed perfectly in order to ensure adequate dewatering and preparation of the excavated hole.

"Our tank sizing was set up for this type of project – but any time the tanks are being installed at a coastal site the high water table, sand and environmental concerns can all create unique challenges."

- Phillip Shoaf, Shoaf Precast

The b belov



Handled by Quality Septic Services of Newport, N.C., the installation process required careful coordination between the precast delivery drivers and the crane operators. To complete the project, the installer also had to do horizontal boring under the main highway – a process that Clayton said went smoothly. However, some challenges did emerge when the sidewall located outside of a trench box collapsed when one of the 10,000-gallon tanks was being set.

"The weight of the sand pinned the trench box against the wall of the tank," Clayton said. "That added some time to the project. We were digging out sand well into the sunset hours."

The sandy soils made the digging process fairly easy, but also created some issues because of their structureless nature.

"Just keeping the tank holes open to be able to set the tanks was probably the biggest challenge from the precast tank installation perspective," Clayton said.

PRECAST WAS THE NATURAL CHOICE

Headquartered in Lexington, N.C., Shoaf Precast worked with AQWA to provide one 8,000-gallon septic tank, one 10,000-gallon septic tank and one 10,000-gallon flow equalization tank. Shoaf Precast also made a 5,850-gallon recertification tank that included a 4,000-gallon grease trap plus one smaller, 1,000-gallon dosing tank. The pieces were 11-feet-by-4-feet wide and 21-feetby-4-feet long and weighed up to 42,000 pounds each.

All of the tanks were made using the precaster's 10-by-20-foot mold and standard design. The tanks also had to be watertight to ensure that their contents would never leech into the area groundwater.

"Our tank sizing was set up for this type of project," Vice President Phillip Shoaf said, "but any time the tanks are being installed at a coastal site the high water table, sand and environmental concerns can all create unique challenges."

For example, Shoaf Precast had to modify its rebar schematics in order to accommodate the project site's high water table. The modifications included adding more rebar and increasing the size of some of the bars.

Shoaf Precast also had to factor buoyancy calculations into the production process to ensure that no buoyancy issues would arise during seasons when Atlantic Beach's water table was high.

"The weight of the precast helped us

achieve our anti-buoyancy goals compared

The precast manufacturing process was

fairly straightforward, but there were some

additional logistical obstacles to navigate. For starters, the site is 260 miles from

Shoaf Precast's plant, and all of the tanks

were buried in driving areas so they had to

"Given the lot's small footprint, we

had to make sure the trucks were staged

and that they didn't just converge on the

site all at once," Shoaf said. "We worked

closely with AQWA and Quality Septic to

with it. From what we heard, everyone was

According to Clayton, Coral Bay Club's

within the desired timeframe and met the

"The treatment system is functioning

spectacularly and is producing very good

effluent," he said. "I think everyone would

Carteret County representatives also

are pleased with the outcome, particularly

from the environmental perspective.

treated effluent into a drip irrigation

level of treatment was occurring - or

not occurring - for the 60-year-old

infrastructure?" Clayton said. "The

club was pleased to be able to get the

project done not only in its own best

environmentally-conscious manner."

interest but also in a very sustainable and

"The facility is now putting highly

system where before. Who knows what

wastewater overhaul was completed

come up with a good plan and we stuck

pleased with the outcome."

FUNCTIONING SPECTACULARLY

agree that it was a success."

budget.

to options like plastic or fiberglass, where

there would have been some significant

concerns for sure," Shoaf said.

be traffic-rated.

Shoaf Precast designed box culverts with thicker diagonal sections to accommodate the requirements for the project at Coral Bay Club.



A LONGTERM SOLUTION

Reflecting on the role precast concrete played in the coastal wastewater project, Clayton said it was the obvious material of choice and that Shoaf Precast was clearly the best company to make the massive tanks.

"We love Shoaf Precast's tanks, and particularly their very large products," Clayton said. "We use them a lot in our commercial and large community systems."

Clayton said Shoaf Precast's attention to detail and commitment to sticking it out until the project is up and running sets the company apart from other tank manufacturers.

"A high-quality precast tank on a sensitive installation like this is very reassuring to the installer, engineers, owners and regulators," he said.

"With Shoaf Precast's tanks, no one ever has any doubt that those products will still be watertight a decade from now. Precasters like Shoaf, who stay onsite until they are certain that the precast tanks are installed properly and are structurally sound and watertight, make choosing precast tanks for a job like this an easy choice."

Q1 2023 | precast TODAY 53



BIGGER AND BETTER IN THE BUCKEYE STATE

n n U



RECORD ATTENDANCE, RECORD NUMBER OF EXHIBITORS, RECORD SHOW FLOOR SIZE IN COLUMBUS, OHIO.

Photos by Heather Bremer

The sun shone down on The Precast Show 2023 – both literally and figuratively – as record-setting crowds enjoyed three days in Columbus, Ohio.

A 70-degree afternoon welcomed the Grand Opening on Thursday, Feb. 23, with nearly 5,300 registered attendees taking to the 120,000-squarefoot show floor filled with 378 exhibitors. NPCA members visited booths to see the latest technology and build relationships with vendors who help fuel the precast concrete industry. Cornhole tournaments, T-shirt screening and even a hands-on display of virtual reality crane operations are just a few examples of the engaging displays that drew in crowds and captured attention.

Here is a rundown of some of the key moments and events.

By Joe Frollo

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





KEYNOTE LUNCHEON KICKS EVERYTHING OFF

More than 600 people gathered for the Keynote Luncheon on Thursday to celebrate association members and kick off The Precast Show 2023.

A record-number 63 men and women received their gold hard hats and graduation certificates as they became Master Precasters. The signature NPCA educational program includes two years of study covering precast basics, safety, production, technical, quality control and leadership. Graduates ascended the stage to the applause of the crowd. The event also included celebrations of the Leadership NPCA graduates, NPCA plant certification anniversaries, Safety Awards and Best Practices Awards as well as a keynote address by economist Andrew Busch.

HONORING JOAN BLECHA AND TED COONS

As part of the Keynote Luncheon, NPCA Chair of the Board Joel Sheets presided over a special presentation, bestowing on behalf

See the equipment, Talk to our team.



CONTROL FREAK. [CATALOG PDF

EZG's Precast Hog[®] Delivery System

drastically reduces vibrating and placement time by efficiently delivering up to 4 cubic yards of concrete, letting you control the pour to avoid wastesaving you money and manpower.

- Fully customizable delivery & mixing systems
- Hydraulic, electric or gas-powered options
- Adjustable auger for uphill delivery
- Moves easily from point to point

American-made and built to last, all units can be manufactured to fit your needs and specifications. Connect with our technical team to build your hog at ezgmfg.com.

1-800-417-9272 / ezgmfg.com / sales@ezgmfg.com 1833 N. Riverview Road, Malta, Ohio 43758

EZG Manufacturing is a division of EZ Grout Corporation. All EZG Manufacturing products are backed by our two-year warranty on parts unless otherwise stated

f @ D in Y LIKE / COMMENT / TAG / SHARE I







of the Board, Lifetime NPCA Memberships to Joan Blecha and Ted Coons.

These leaders were recognized for a half-century of service each within the industry. They are mentors and role models to generations of precasters, hundreds of whom were in the room, setting the bar high for others to look to as professionals and as people.

Blecha served as Chair of the Board, becoming the first woman to hold that position. As Chair, she led the modernization of NPCA's plant certification process, among her many other noteworthy accomplishments.

Coons has served on numerous NPCA committees, guides the Yoakum Award Committee and helped build the NPCA Education program among his many noteworthy accomplishments.

Both also are Robert E. Yoakum Award winners.

PLANT TOURS

More than 600 people boarded buses Thursday morning for a short ride to E.C. Babbert facilities in Lancaster and Canal Winchester, Ohio, to enjoy The Precast Show Plant Tours.

With breakfast starting at 4:30 a.m. and the first bus pulling out an hour later, the record-setting, sold-out tours were packed with enthusiastic riders looking to learn how things get done at Babbert.

EDUCATION

Precast industry experts led two days of education classes, drawing 1,130 men and women to the classroom for discussions on concrete production and repair, leadership and management, marketing and sales, quality control and more. More than 200 individuals also took steps toward becoming Master Precasters by completing one of the three Production and Quality School courses offered in Columbus.

PRIZE GIVEAWAYS

The Precast Show once again gave away \$10,000 in prizes to randomly selected attendees, including a grand prize of \$5,000 on the Show's final day.

Once a name was called, winners had 10 minutes to locate the prize cart and claim their reward, which ranged from a Yeti cooler to a 36-bottle wide fridge to a \$5,000 gift card grand prize that was

taken home by Bertin Diaz Escalante of Encore Precast in Dayton, Ohio.

FOUNDATION STUDENT COMPETITION

Cal State-Chico repeated as champion of the NPCA Foundation Student Competition, delivering its winning presentation at The Precast Show. New Jersey Institute of Technology and McNeese State also presented as finalists.

Chico earned \$7,000 in prize money, divided between participating students and the school's Concrete Industry Management program.



ENGINEERED SOLUTIONS for your precast project ACCESSORIES // CHEMICALS // FORMING

DAYTON

Clean Strip

Kodi Klip rebar connector system

Swift Lift® System Fleet-Lift® System Utility Anchors Kodi Klip[™] System

Sandwich Panel Connectors Aztec[®] Products Precast Chemicals

Lifting & Handling Inserts Threaded Inserts Splicing Systems Formliners



No matter where you are, what you need, or how complex the job, Dayton Superior is your source for the industry's LARGEST AND BEST portfolio of PRECAST PRODUCT SOLUTIONS.







©2023 Dayton Superior Corporation

🔘 in 🖻 😏

CONTACT US

800-745-3700



Clockwise from top left: Crew Cat posed with NPCA members at the Final Event, hosted at Lower.com Field; The Precast Show is the premier spot to talk precast concrete products, accessories and technology; The Jumbotron with The Precast Show logo at Lower.com field could be seen by everyone driving along I-670 in Columbus; Multiple generations of Master Precasters celebrated into the night at Howl at the Moon during The Bash.

SILENT AUCTION

The NPCA Foundation/PCI Foundation Silent Auction raised more than \$131,000 thanks to hundreds of bidders and winners throughout the month.

Big ticket items included four Green Bay Packers tickets and a tailgate party; a hunting trip for two at Webb Farm; vacation getaways to Great America West and California wine country; and dozens of discounts for equipment and items provided by Precast Show exhibitors.

CLOSING EVENT

A Saturday night celebration at Lower.com Field, home of MLS franchise Columbus Crew, capped The Precast Show with a celebration of friends, fun and festivities.

Visitors were greeted by Crew Cat, the Columbus mascot, who posed for photos and played with fans of all ages. A full-sized soccer goal was available to test kicking skills, and the Crew locker room was available for tours.

Entertained by a local band, NPCA members danced and celebrated another fantastic week together at The Precast Show.





7

Modeling in Tekla Structures allows you to automate:

- Rebar bending and BOM schedules
- Lifter placements around COG
- Creating and revising drawings
- Adjustments of rebar around openings and concrete geometry

Schedule a demonstration today at tekla.com/us/contact



WORKING for YOU

WORLD OF CONCRETE

NPCA's Brenda Ibitz, Chris Frederick, Marti Harrell and Tom Rodak were in Las Vegas on Jan. 17-19 to represent the industry at World of Concrete.

The annual show brings together producers, vendors and industry members from around the globe to share and discuss new technologies and systems.

NPCA hosted a booth where staff members promoted membership, the benefits of plant certification and the precast concrete industry at large.

Ibitz is the vice president of development at NPCA. Frederick is the senior director of membership and regulatory services. Harrell is vice president of education and workforce development and NPCA Foundation executive director. Rodak is vice president of marketing and communications.

2023 Webinar Lineup

NPCA's webinar package for 2023 includes eight opportunities to interact with industry experts on topics that affect every precast concrete facility.

Webinars are sold on a facilitywide basis, so multiple workers at the same location can benefit from them. By purchasing the 2023 package, you also receive more than 100 archived webinars from past years to use as well. Webinars also are available on an a la carte basis.

HERE IS THE 2023 LINEUP:



CHFOL'SAN LUIS OBERO

CONCRETE CANOE SCHOLARSHIPS

NPCA in November awarded scholarships to 10 universities that are sending teams to the ASCE Concrete Canoe National Competition, provided to help teams offset the cost of construction and travel.

The ASCE Concrete Canoe National Competition provides students with an opportunity to gain hands-on practical experience while testing their skills with concrete mix designs and project management. Known as the "America's Cup of Civil Engineering," the competition began in 1988 and combines engineering excellence, hydrodynamic design and racing technique.

NPCA awarded \$500 scholarships to:

- Bradley University
- California Polytechnic State University
- Colorado School of Mines
- Lipscomb University
- Louisiana Tech University
- McNeese State University
- New Mexico State University
- New York University at Tandon
- Northeastern University
- University of Pittsburgh at Johnstown

NPCA ON THE ROAD

NPCA staff members have been Working for You at several industry events throughout the fall and winter. Some of the events include:

McNeese State University – Lake Charles, La. – Oct. 12-13

Harrell joined Director of Outreach and Technical Education Claude Goguen, P.E., at McNeese State University to talk precast concrete with a group of engineering students. Among the projects that Harrell and Goguen walked the students through was testing the use of corn husks as natural fibers within concrete.

NPCA Board member and Locke Solutions President Asher Kazmann as well as Gainey's President Greg Roache presented virtually to the group as well.

ASTM CO9 Committee – New Orleans – Dec. 4-7

Goguen represented NPCA and its members at the Committee on Concrete and Concrete Aggregates meeting in New Orleans, where the group addressed its jurisdiction over more than 175 standards in concrete production.

City of Omaha – Omaha, Neb. – Dec. 20

Frederick and Director of Quality Assurance Programs Phil Cutler, P.E., traveled to the largest city in Nebraska to continue a conversation with the city engineer about the benefits of working with NPCA certified plants.

Currently, 40 states and more than 75 counties and municipalities recognize NPCA certification when specifying projects.

For a full list of where NPCA staff members are going and where they have been, visit Precast.org/WorkingForYou.

BOARD REPORT

The following is a report on the NPCA Board of Directors' meetings for the fourth quarter of 2022.

Board Meeting – Nov. 5 in Amelia Island, Fla.

- Approved the Sept. 20, 2022, Board Meeting minutes.
- Approved the Sept. 30, 2022, Financial Statements and Investments.
- Approved the 2023 budget as recommended by the Executive Committee.
- Approved the creation of an Alternative Materials Committee.
- The Executive Committee (as reported to the Board) approved the NPCA Reserve Policy and NPCA Investment Policy for another year.
- Approved the proposed edits to the QA/QC Manual for the 16th Edition and kicked off the 60-day comment period.



C

WE MAKE SEALANTS FOR LONGER-LASTING, WATERPROOF STRUCTURES. CONSEAL HAS WHAT YOU NEED TO SEAL VIRTUALLY ANY APPLICATION.



ANY COLOR

COLOR MATCHED WATERPROOF COATING & ELASTOMERIC JOINT SEALANT APPLIED TO ARCHITECTURAL CONCRETE JOINT









SEAL OF SECURITY. BOND OF TRUST.



TERRA COTTA

People & Products

PEOPLE & PRODUCTS IS A FORUM WHERE NPCA MEMBERS AND NONPROFIT ORGANIZATIONS CAN SHARE INFORMATION ON NEW PRODUCTS, PERSONNEL PROMOTIONS, ACQUISITIONS OR SERVICE ANNOUNCEMENTS CONCERNING THE PRECAST CONCRETE INDUSTRY.

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



SUPERIOR CONCRETE, NATIONAL PRECAST TEAM UP ON HYBRID VAULT

A collaboration between NPCA members Superior Concrete and National Precast called Environmental Containment Corporation (ECC) now offers precast ponds and precast vaults, including a stormwater containment named "Hybrid Vault."

ECC's Hybrid Vault system utilizes cast-in-place floors, precast walls and prestressed lids. This combination allows the system to use a smaller footprint by reducing internal walls/chambers and providing a sloped floor to the center and low point. Its shape and small footprint mean less excavation and less land intrusion, reducing land use and maintenance costs down the road.

This means ECC's Hybrid Vault systems are rated to a higher, heavier traffic standard than typical structures, resulting in a more structurally sound containment system.



JENSEN PRECAST HAS NEW CEO

Jensen Precast recently announced **Eric Jensen** as chief executive officer. He succeeds Donald Jensen, who founded the

company and remains Chairman of the Board of Directors.

Eric Jensen, 55, has held several roles at Jensen Precast since joining the family business as a teenager. Most recently, he has led the company as president and previously served as chief marketing officer. He is a graduate of Harvard Business School and a former member of the NPCA Board of Directors.

WELLS PROMOTES DEMANT, KLOOS

The Wells Group has promoted Josh Demant to director of project management for its Great Lakes region and Steve Kloos to president and chief operating office of its Mountain States division.

Demant transitions from his prior position of interim plant manager for Wells' Crystal Lake, Ill., manufacturing facility. In this new role, Demant works closely with other regional project management leaders, bringing regional insight to develop best practices and ensure consistency in project management processes across all Wells' divisions.

A 27-year veteran of Wells, Kloos began in the Ready Mix Division, ascended to general manager and most recently served as senior vice president of quality. In this role, Kloos now is responsible for preconstruction, sales, engineering, operations and field and installation services throughout the mountain states.

KUBAT RETIRES FROM WELLS AFTER 42 YEARS

Spencer Kubat has retired from Wells after 42 years with the company, most recently as vice president of sales for Wells Midwest. Kubat started his career in 1980 with Wells.

"These past 42 years have been nothing short of great," Kubat said. "I've gained a second family through my coworkers and client partners who put their trust in Wells and in me, I know these relationships will last well into the future."



DUNCAN NAMED PRESIDENT OF AFINITAS FORMING SYSTEMS

Jason Duncan is the new president of the Afinitas Forming Systems Division. Duncan succeeds Iamie

Jason Duncan

Wegner, who will remain on the Afinitas executive leadership team and will focus on strategic and organizational initiatives.

Prior to joining Afinitas, Duncan spent 16 years with Forterra (now Rinker), serving in engineering, sales management as well as general manager, vice president of specialty products, vice president of stormwater management, vice president of strategic accounts and most recently as vice president/general manager.

AFINITAS ACQUIRES HAALA INDUSTRIES

Afinitas recently completed its acquisition of Haala Industries, a manufacturer of steel-fabricated products, including rebar mats, wire cone cages and related accessories for precast concrete and drainage applications.

Headquartered in Sleepy Eye, Minn., Haala Industries was founded in 1974 by Dave Haala. For nearly 50 years, Haala has designed and manufactured steel products, including fabricated rebar mats, wire cone cages, threaded products, drainage gates and guards.

CALEASE NAMED

DIRECTOR OF

ENGINEERING

Jared Calease is

the new director

of engineering

for the Afinitas

Forming Systems

Division. Calease

previously worked

BURNS JOINS

GARDEN STATE

Daryl Burns,

the staff at Garden

Burns is a precast

design engineer

concrete structural

P.E., has joined

State Precast.

PRECAST





for the New Hampton engineering team as a product designer.

Prior to rejoining Afinitas, Calease spent the last 14 years at GMT Corporation in Waverly, Iowa. He served in a variety of roles there, including senior manufacturing analyst, senior manufacturing engineer, engineering and quality manager and commercial estimating manager.



Daryl Burns

who holds a professional engineer's license in 31 states. He most recently worked for NPCA as its director of codes and standards.

Burns has served on various NPCA committees and task forces and also served on the NPCA Board of Directors from 2018-21.

TINDALL EXPANDS T-SLAB MANUFACTURING LINE

Tindall Corporation is opening a dedicated T-SLAB production line at its Mississippi manufacturing plant. Tindall now offers the floor slab system to the Mississippi, New Orleans and other markets in the Gulf States markets.

T-SLAB uses lightweight concrete to serve as arch shaped blocks over which structural concrete is poured, leveraging the principles of arch design for load distribution while capitalizing on longitudinal prestressing for total span capabilities. Multiple slab thicknesses enable T-SLAB to achieve optimal spans in the range of 30 feet to 45 feet supporting typical commercial and residential floor loads.



HEFNER TO LEAD ASCC

The American Society of Concrete Contractors has hired **Gordon Raymond Hefner** as executive director. Hefner

Gordon Hefner

replaces Bev Garnant, who led the association for more than 20 years. Hefner brings 27 years of association management experience in the construction trades.

Hefner earned an undergraduate degree from the University of Missouri-St. Louis and a master's degree from Webster University. He holds a Certified Association Executive credential from the American Society of Association Executives.

TEKA MARKS 50TH ANNIVERSARY IN NORTH America

TEKA recently celebrated its 50th year in North America as a supplier of mixers and batch plants for the concrete products, glass and refractory industries. Established in Germany in 1961, TEKA's U.S. production began in 1972, when founder Alfred Gartner and his brotherin-law Helmut Lorenz set up shop in Long Island, N.Y.

Go Mobile With Titan 4 Mobile Apps to Keep Your Business Growing

Titan 3000, the total precast plant management system, includes four handy mobile apps to help make you more efficient, cut costly mistakes and increase profits. Contact us today and Go Mobile With Titan 3000!

CONTRACTOR HUB

Seamless Collaboration With Contractors

Titan's Contractor Hub is an exciting service that strengthens the collaboration between the precaster and contractor. Through our secure internet hub, precasters and contractors can share up-to-theminute information about their jobs - without making a phone call!

OCTITAN

Make Your QC Mobile - And More Efficient

The QCTitan mobile app reduces duplication of data, cuts down errors and makes your QC more efficient. With QCTitan you can:

- · Digitize inspections and testing of products
- Improve accountability of inspections
- Create a custom reporting dashboard for metrics
- Integrate with Titan's scheduling and inventory modules ... and MUCH MORE!

PICKIT

Simplify and Confirm Your Product Staging

Timely product delivery is critical to every precast business. That's where Titan's PickIT app comes in. PickIT simplifies your staging needs by confirming that products scheduled for delivery have been fully produced and quality checked. With PickIT, simply scan a product's barcode to verify that the correct item is ready to load, and then double-check the log to ensure that all necessary quality control steps have been taken. It's easy - and mobile with PickIT!

SIGNIT

Paperless Delivery Ticket App

A Contractor Hub app, our new paperless delivery ticket mobile app allows truck. drivers to get delivery tickets signed on the go right from the convenience of a phone or tablet. Simply the best way to stay on top of all of your loads and delivery tickets, and get your invoices out guicker.



Billions of dollars of precast guoted, produced and delivered every year - with Titan!

















This is Prima.



Automated Wetcast Production Solutions

Prima is powering a new era of wetcast production efficiency. Our automated wetcast production workstations and Prima Base monolithic manhole design and milling system bring unmatched productivity, versatility and visibility to a traditionally manual process. With Prima, you'll benefit from:

- Fewer labor resources
- Advanced production tracking software
- Increased profitability and throughput

This is Prima. A smarter way to wetcast. Learn more at www.afinitas.com/prima



Intelligent Infrastructure Solutions Afinitas is a global, comprehensive and customer-oriented infrastructure equipment and services platform that brings together the expertise of HawkeyePedershaab, BFS, New Hampton Metal Fabrication, Spillman, and CAM Products.

Headquarters: 8040 Forsyth Blvd. | St. Louis, MO 63105 USA | +1 314-726-2178 | info@afinitas.com North America: +1 319-394-3197 | Denmark: +45 9645 4000 | Germany: +49 7344 96030