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MAGAZINE

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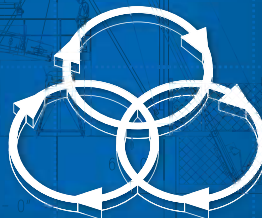
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Eye of the Economic Storm

Precast Concrete Plant Survival in a Challenged Economy

BY TY GABLE | *President, National Precast Concrete Association*

We're in the midst of an economic hurricane that has been spinning around for years now.

A recession is like a hurricane, because both have three phases. In phase one of a hurricane, high winds, rains and coastal flooding wreak havoc. Phase one of this recession – the tail end of 2007 through 2009 – was a bruising battle to be sure. A 40% to 60% drop in demand is about as bad as it gets, and we haven't exactly seen a whole lot of improvement since then.

Phase two is the eye of the storm, which is where we are now. In the eye there is an uneasy calm, with an emphasis on the uneasy part. Despite some slow gains, a continued upward trend is in no way ensured at this point. The European debt crisis, concerns over rising fuel costs and a languishing housing market are making sure of that. Some economists even argue that the 15 years of prosperity we enjoyed were the "bubble" and that this is reality.

In this stage, business owners tend to freeze up because things aren't getting any worse, but they don't seem to be getting any better either. Right now we're just sort of hanging in the balance, which makes it a hard time to take decisive action. However, that's precisely what we need to succeed going forward.

Positioning your company for future growth, particularly in an economy unlike anything any of us have faced in our lifetimes, is not easy. Timing decisions and determining when, where and how much to invest will not be simple or painless. Going back to the hurricane metaphor, though, we are now headed toward phase three of this recession – the most dangerous phase of all.

It is the trailing end of a hurricane that often does the most damage, when the storm surge produces devastating winds and flooding rainfall. In a recession, the danger comes when companies board up the house in phase one, sit tight during phase two and then stall during phase three, making no plans to start the rebuilding process once the storm passes. Caution is commendable, but it can't come at the cost of innovation, diversification and customer education and acquisition. There has to be anticipation of a recovery and a plan to adapt to the new business landscape in order to capitalize on it.

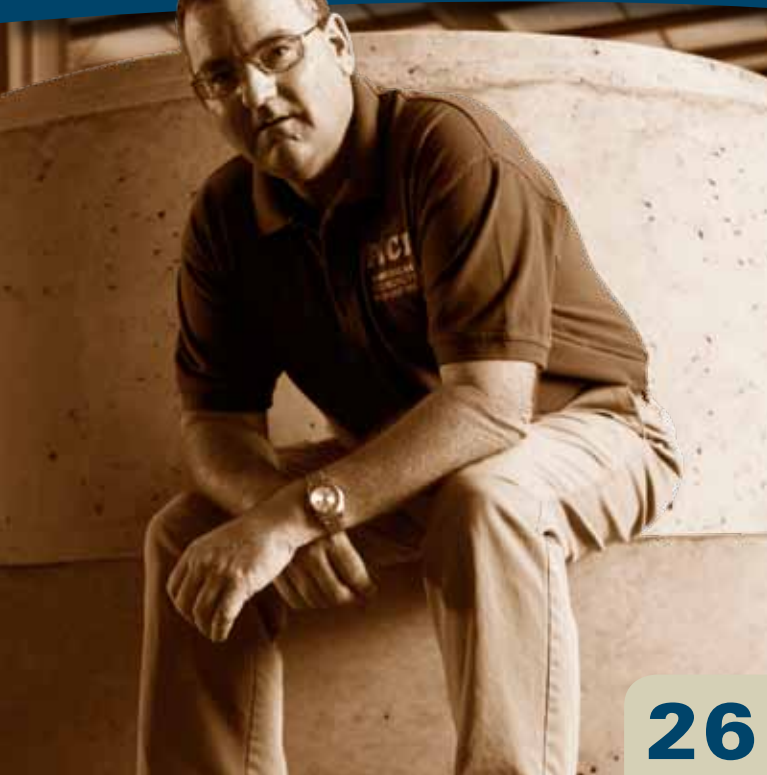
There are at least three certainties to plan for as you're considering the post-hurricane economy. Despite the thinning of the herd, count on the paradox of increased competition; prepare for customers who demand new products, higher quality and more value; and recognize the absolute necessity of a well-trained workforce.

This protracted down cycle in construction is going to continue to reduce the number of competitors, leaving fewer contractors and precasters, with most survivors learning the importance of diversification. They're not specializing like their fathers or grandfathers, but generalizing by manufacturing new products, bidding projects farther from home and aggressively going after new work.

Also, when private and public construction buyers do have money to spend, they are going to want proven sustainability benefits along with their quality and value demands. Thanks to the internet and the way it has opened the door to information, they are going to be more demanding and educated than ever. You need to be there to reach out to prospective buyers on the benefits of precast wherever they choose to go for information. If you haven't done this type of marketing before, we offer many educational and informational resources on our website.

Lastly, you know as well as I do that good employees are, and will continue to be, hard to find. Unfortunately, some talented and experienced people have left our trade and found places in other industries. This means you're going to have to search harder because attracting and retaining top talent are more important than ever in tough times.

Like a hurricane bearing down on the coast, change is inevitable and can't be stopped. But if you embrace the post-recession economy by adapting and sowing some seeds now, it will help you reap the benefits down the road. ■



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COVER STORY

Patient & Positive

Bob Snowe, owner of American Concrete Industries Inc. in Fort Pierce, Fla., navigated a rough start when building his company from scratch, then survived the tough economy through perseverance and personal relationships.

Photo by Ron Hyink

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

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

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Zero-Slump Concrete: A Straight-Up Tool in a Tough Market

Dry-cast technology may offer market advantages with alternative manufacturing methods.



BY PHILLIP CUTLER, P.E.

There is good reason concrete has been around for centuries. Concrete is the oldest, most adaptable and most durable building material known to humanity – dating back to the Roman Empire and perhaps even earlier – and precast concrete's advantages continue to grow with each new technological advance.

The subject of this article may be old news to some and a jewel to others. In any event, a review of some of dry-cast concrete's particulars is in order, especially in view of today's volatile market conditions. A new concrete manufacturing process may be just the edge a precaster needs right now. Diversifying or improving plant production efficiencies for any given product may provide the foundation for staying competitive and innovative; they are the tools needed to win bids in today's market. Whether you make a niche or standard series of product using a traditional wet-cast manufacturing method, today

might be the day to consider something new. Or if you are considering diversifying into another product line to satisfy a local or regional market demand, don't forget to consider alternative manufacturing methods to maximize your business investments.

Consider your options

Just what is this alternative technology? Known by many different names – zero-slump, dry-pack, dry-cast, vibrant dry tamp, no-slump and roller-compacted – these concrete types and their manufacturing methods are all very much part of the same discussion.

Consider this: A zero-slump concrete mix can be used to manufacture a wide variety of precast concrete products just as a conventional wet-cast or SCC (self-consolidating concrete) mix can. However, if your market demands higher volumes and quicker turn-around delivery for a given product, a dry-cast

process may be just the ticket to increase production rates and lower manufacturing costs.

Clearly, there are significant differences in some of the manufacturing processes and handling equipment requirements using a zero-slump concrete compared with conventional wet-cast or SCC. The most significant contrasts are found in the casting and consolidation processes, forming equipment, curing and in the handling equipment.

Casting and consolidation: increased impact

Proper casting and full consolidation processes are key elements for successful manufacturing for zero-slump concrete products. Typically, conveyor belts transport the mix to the formwork as the wet concrete is fed slowly and continuously while being consolidated. Additional consolidation effort is necessary for zero-slump concrete and can be achieved through specialized equipment such as vibration tables, compaction or drop tables, continuous-duty form vibrators, pipe machines and extrusion presses.

Optimal consolidation using vibration depends on three variables:

- Vibration amplitude (force)
- Vibration frequency (speed)
- Location and positioning of vibrators

Depending on the makeup and consistency of a mix, impact forces from one to two times the weight of concrete and formwork are needed to effectively consolidate a dry-cast mix. Vibration equipment, with frequencies varying from approximately 3,000 to 16,000 vibrations per minute, is readily available for dry-cast production.

Forms and accessories: more rigid

More rigid forms and forming equipment are required for a zero-slump concrete manufacturing process compared with normal-slump concrete production. Increased rigidity is necessary to efficiently transfer the vibration energy to the forms and accessories. Added strength and long-term durability in formwork are also necessary to withstand the continuous impacts of consolidation to avoid early wear and damage.

Concrete curing: controlled

The curing process is particularly important with zero-slump mixes. Adequate curing enhances concrete's desirable properties such as strength, impermeability, surface hardness and crack resistance. Early curing periods are most critical to ensure protection from extreme temperatures and dryness.

Concrete cannot cure properly without an adequate amount of water in the mix. And, because the forms are removed immediately, dry-cast products have an undesirable tendency to dry too quickly. As such, dry-cast products must be protected from drafts to prevent cracking due to surface moisture loss. Consequently, a dedicated curing area, such as an insulated enclosure with misters, is generally required.

A normal curing cycle for dry-cast products includes a preset

period of about two hours, a ramp period (to raise ambient temperature to the desired curing temperature) of two to three hours, and a hold period (at the target temperature) of four to six hours. These curing cycles will vary with the type of product being cured.

Curing in a controlled, moist environment dramatically increases the concrete's rate of strength development. In many cases, full design strengths can be achieved in one day.

Handling equipment: automated

Material handling equipment in dry-cast production is generally different from that required for wet-cast production. Product off-bearing and stripping are usually performed with overhead cranes or fork trucks, although automation is becoming increasingly common in precast plants producing dry-cast products.

Conclusion

Zero-slump concrete and dry-mix technologies merit a second look when precasters consider diversifying their product line. The lower labor costs and increased production rates of zero-slump concrete could make their consolidation "bang" worth their buck. ■

Phillip Cutler, P.E., is director of Technical Services.

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PART 2

Top Precast Plant Operational Deficiencies

A staff engineer reports on pre-assessment audits for the NPCA Plant Certification Program.

BY EVAN GURLEY

Editor's Note: We continue with part two of this four-part series about common problems encountered during a typical pre-assessment plant inspection. All deficiencies listed in this series relate to the six chapters of the *NPCA Quality Control Manual*. Part 1, published in the January-February 2012 issue of *Precast Inc.* and available at <http://precast.org/publications>, listed the first five deficiencies. We continue here with five more.



6 Lack of documentation on pre-pour/post-pour inspection sheets

Pre-pour and post-pour inspections are intended to be a useful tool and quality control measure for the plant personnel, not a “pencil-whipping task” that adds no real benefit or continuous quality control improvement. As outlined in Section 4.3 in the NPCA QC Manual, pre-pour inspections shall be performed prior to casting each form.

For each form used, the following must be checked: form dimensions, tightness, cleanliness, release agent application, positioning and securing of reinforcing, embedded items and block-outs.

Section 4.6 of the NPCA QC Manual states that post-pour inspections must be performed on each product. The inspections must document: any damage, excessive bug holes or honeycombing, poor dimensional tolerances, or other problems such as exposed reinforcing. The minimum required checks are heightened for certain products as specified in Chapter 6 of the NPCA QC Manual.

A usual occurrence is that a plant will have a pre- and post-pour inspection sheet in place, but the check sheet developed will not adhere to the minimum requirements outlined in the NPCA QC Manual. Rather, the checklist produced will be vague

PRE-POUR AND POST-POUR INSPECTION SHEETS ARE MEANT TO BE A CONTINUOUS IMPROVEMENT TOOL. NPCA file photo

and will not provide space for comments or additional notes, such as actual dimensions taken of the product. It is not uncommon to see 20 checklist pages of red check marks in boxes indicating that for the last 20-plus production days, not one quality control issue was noted when

setting up or stripping precast product.

Plant personnel performing these checks should realize that inspection lists are intended to be a continuous-improvement tool and not a cause for supervisory repercussions if staff noted that something was less than perfect. The important thing is that any quality control issue discovered is properly resolved, and a positive learning experience and greater product quality are the intended results.

CORRECT REBAR SIZE, AND PROPER POSITIONING AND COVERAGE OF REBAR ARE CRITICAL REQUIREMENTS. PROPER CONSOLIDATION WILL MINIMIZE SEGREGATION OF THE CONCRETE.

NPCA file photos

7 Improper positioning of reinforcement

Proper positioning of reinforcement is a critical procedure, and starting in 2012 it will also be a critical requirement in the NPCA Plant Certification Program. As stated in Section 4.3.3 in the NPCA QC Manual, reinforcing steel must be positioned as specified by the design, and the concrete cover must conform to product requirements.

Even if the product is not made in accordance with any ASTM or other industry specifications, the NPCA QC Manual states that the concrete cover shall not be $< \frac{1}{2}$ in. at any point, and strongly recommends a cover of $\frac{1}{2}$ in. or greater. This is true for any product. ACI, ASTM and other standards with greater coverage requirements take precedence over what is outlined in the NPCA QC Manual.

The real problem observed in some plants is that staff is simply not aware that serious structural damage can result when proper reinforcement positioning or coverage is not achieved. Proper positioning of reinforcement is a big deal, and an incorrect bar size or placement errors can lead to failure of the precast concrete structure. For instance, some plants try to use rolled welded-wire reinforcement for straight-walled products, and without proper mechanical straightening, this practice causes numerous concrete coverage issues. Liberal use of chairs, spacers and positioning wheels is strongly encouraged, especially for smaller-diameter bars or wire.

8 Improper consolidation of concrete

Concrete must be consolidated to minimize segregation of the concrete. This means that internal vibrators need to be lowered vertically into the concrete, without being forced, downward until the tip of the vibrator reaches the bottom of the form or until it penetrates into a previously consolidated lift. Vibrate the concrete until air bubbles within the vibrator's field of action stop coming to the surface. Withdraw the vibrator slightly slower than it was lowered. Reinsert the vibrator in an adjacent area, making sure the fields of action overlap. Repeat the vibration process until all the concrete in the product has been consolidated.

This is how concrete should be consolidated with an internal vibrator, but it is not always what one finds during pre-assessment visits. Internal vibrators should not be used to move concrete laterally and should not be dragged horizontally





MOISTURE
CONTENT
IN THE
CONCRETE
MUST BE
DETERMINED
AT LEAST
ONCE PER DAY.
NPCA file photo

throughout the concrete. Internal vibrators should not be forcefully jammed into the concrete for a brief duration of time and quickly removed before air bubbles stop coming to the surface.

For thin-wall forms with minimal volume, internal vibrators may be laid horizontally to achieve proper consolidation, but vibrators must not be dragged horizontally through the concrete; they must be lifted and placed vertically throughout the concrete mass. Dragging the vibrator through the mix can cause separation of the aggregate and the cement paste, resulting in unacceptable bug holes or honeycombing in the finished product.

Over-vibration is also frowned upon, as this can cause excessive segregation of the aggregates and the cement paste; reduction in the amount of entrained air in the concrete; and less durability of the concrete exposed to freezing-and-thawing environments.



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9 Guessing at moisture content

"I can eyeball the aggregates and determine if I need to add or subtract water from the mix." This is something we have heard as a way to gauge aggregate surface moisture content. Eyeballing the aggregate surface appearance (wet, damp or dry) is not an acceptable way to accurately measure the aggregate moisture content, even if you have raptor-like eyes. Nor will eyeballing meet the requirements outlined in Section 5.2.2 in the NPCA QC Manual, which states: For conventional and/or dry-cast concrete, aggregate surface moisture content shall be determined at least once per day in accordance with ASTM C70, "Standard Test Method for Surface Moisture in Fine Aggregate," by alternative methods such as moisture meters or probes, or by ASTM C566, "Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying."

If you're using self-consolidating concrete (SCC), you're dealing with a new beast altogether. SCC is very moisture-sensitive, therefore precise control of the water content is essential. If moisture probes are used for aggregates in SCC, the aggregate surface moisture content must be determined at least once per day prior to making the first batch of SCC by tests mentioned previously. If the plant does not use moisture probes or meters, then the moisture content must be determined at least once per day prior to making the first batch of SCC and then once every four hours of elapsed time after the first batch for the duration that SCC is being mixed.

Verifying aggregate surface moisture will allow for necessary adjustments in mix water as the moisture content of the aggregates changes throughout the day. Slump flow and VSI (viscosity stabilizing index) testing will confirm whether an SCC mixture is within specification. Slump flow and VSI will become necessary for confirmation if ASTM moisture tests are not performed on a regular basis (every three mixes).

10 Failure to provide the correct number of testing specimens

Nobody likes being scrutinized for his or her every move, especially when working under limiting time constraints and facing serious consequences for product failure. Therefore, we empathize with the plant QC inspectors who must make cylinders and test for air, slump, temperature and unit weight – all in front of an inspector and probably their boss! It may be a mundane task, but it is essential that the plant QC inspectors perform concrete testing correctly, with the proper frequency, and maintain the required concrete testing records on file.

For the most part, QC inspectors do a great job performing concrete testing and keeping documentation on file. Sometimes, though, worrisome issues arise. For instance, when making concrete compressive strength cylinders, two concrete samples, not one (for each date tested), require a cylinder to be cast. So, if you were to test the concrete specimen at seven and at 28 days, a total of four cylinders would need to be cast (two specimens at seven days and two at 28 days).

That goes for next-day stripping strength breaks as well.



Many plants perform next-day tests daily to ensure strengths are met before stripping the product from the forms, while other facilities adhere to the NPCA requirements stating that next-day or stripping-strength breaks are required once per quarter year. More often than not, QC inspectors who test daily will forget about the two-specimen rule and cast only one cylinder. This practice is not in compliance with the NPCA QC Manual and will be pointed out and duly noted during the inspection.

For other testing procedures, it is always strongly encouraged that those who perform the test take a quick minute or two to refresh themselves on the proper way to perform the tests according to the ASTM testing procedures. Just like the ACI Grade I test, the NPCA inspector will want to see all concrete testing correctly performed. If something is done incorrectly, even something as small as the number of roddings in a slump test being off by one stroke, the inspector must issue a testing deficiency just as would occur in the ACI Grade I test. ■

WHEN MAKING COMPRESSIVE STRENGTH CYLINDERS, TWO CONCRETE SAMPLES ARE REQUIRED FOR EACH DATE TESTED.

NPCA file photo

End of Part 2, to be continued in *Precast Inc.* May-June 2012.

Evan Gurley is a technical services engineer with NPCA.

Metrics: A Pill Too Big to Swallow

Why metrics proved impractical for U.S. construction.

BY SUE McCRAVEN

"You can lead a horse to water, but you can't make him drink." This adage is apropos of the unsuccessful adoption of metrics in U.S. construction. Our federal government has vacillated on mandating metrics as the primary system of measurement for decades. After almost 50 years of failed efforts, this article explains why the building industry has abandoned metrification.¹

Metrics make sense

Metric units make more sense, right? In the first place, metric units are based on a rational, interrelated base unit system with prefixes in powers of 10. Secondly, the whole world has already converted to metrics. Even the U.S. pharmaceutical, electronics, education, beverage and auto industries use metrics. So why hasn't the building industry gone metric? To help clarify the answer, some historical background is in order.

Metric trivia for conversation starters

- **1866:** U.S. Congress legalizes the use of the metric system. While American scientists and engineers embrace and advance metrics, the general public clings to the familiar inch-pound or Imperial System of measurement.
- **1975:** The Metric Conversion Act of 1975 establishes the U.S. Metric Board to coordinate and plan increased use and voluntary conversion to the metric system; no target dates are set.
- **1982:** President Ronald Reagan disbands the U.S. Metric Board because of its ineffectiveness at bringing about national conversion.
- **1988:** Congress encourages metrification in the Omnibus Trade and Competitiveness Act by designating metrics as the preferred system of weights and measures for U.S. industry, trade and commerce. Most federal agencies are required to use metrics. There is no mandate for the private sector or for highway and construction industries to convert.
- **1991:** President George H. W. Bush signs Executive Order 12770, "Metric Usage in Federal Government Programs," directing all executive departments and federal agencies to implement the use of the metric system. Consequently, the Federal Highway Administration (FHWA) mandates metrification and state DOTs administer the policy. The Concrete Reinforcing Steel Institute (CRSI)² encourages reinforcing steel

manufacturers to use soft metric markings for rebar size and grade (a No. 8 bar still retains its 1.00-in.-diameter measure, but includes the 25 mm [25 M] "soft" metric conversion marking).

- **1991 to 2011:** Use of metric markings on reinforcing bars continues to generate confusion on job sites with respect to specifications. Non-governmental firms and private organizations do not adopt metric units.
- **2008:** Because all FHWA partners have effectively abandoned metrics, the mandate is deemed to no longer make sense, and state DOTs abandon metrics.
- **2011:** ACI's Technical Activities Committee³ encourages CRSI members to mark steel bars with traditional designations. CRSI passes a resolution for members to revert to inch-pound markings on steel reinforcing bars.

Why metric mandates don't work for construction

NPCA asked Bob Risser, P.E., president and CEO of CRSI, for his perspective on why the U.S. construction industry has abandoned metric conversion:



BOB RISSER

Do any U.S. construction projects use metric units?

Risser: No. There are no plans or specifications for construction produced anywhere in the U.S. that currently use metric units. By the late 2000s, the remaining DOTs using metric specifications had converted to inch-pound units. The U.S. GSA (General Services Administration) and the U.S. Army Corps of Engineers no longer

use metrics. In fact, no one in the engineering community, federal government, state government or private business anywhere in the country uses metrics for construction projects.

Why is CRSI reverting back to the traditional inch-pound system?

Risser: It makes logical sense for the industry to begin the process to move away from soft metric markings, because none of our private or government customers are using metric plans or specifications any longer. CRSI's recent resolution phase-in period (until January 2014) will allow industry members



CRSI HAS PASSED A RESOLUTION FOR STEEL REINFORCING BAR PRODUCER MEMBERS TO REVERT TO INCH-POUND MARKINGS ON REINFORCING BARS. *Photo courtesy of CRSI*

Why did many consider converting to metric a fiasco?

Risser: Millions of dollars were wasted because the FHWA, representing less than 20% of the total construction market, wanted to go metric. But because private industry and designers never budged, the entire metric conversion agenda was dead in the water. We haven't calculated the cost to the steel reinforcing industry to retool the stamps to show soft metric conversions.

One of the reasons it was unworkable can be explained with a practical example. We have 12-ft traffic lanes in the U.S., and Europe has 3.8-m lanes (or 11 ft 10 in.). Well, when we started talking hard metric (actual narrower lanes: 11 ft 10 in. instead of 12-ft widths for vehicular traffic), the lawyers got involved. There was the possibility of lawsuits involving safety if lane widths were decreased in a metric conversion. Also, all the American paving equipment manufacturers were producing 12-ft or 24-ft equipment according to the inch-pound system of measurement. These paving equipment manufacturers would have to completely retool, at a cost of millions of dollars, to go to hard metric machinery. Eventually, by the early 2000s, about 40 state DOTs had abandoned metric units entirely.

U.S. construction industry stands alone

Outside the United States, this discussion of reverting to inch-pound units might take a different turn. From a more international vantage point, the U.S. construction industry's failure to convert to the metric system of measurement is apt to be viewed as a step backward. In the late 1960s, for example, England mandated the use of SI units of measurement for all construction, and private designers and engineers followed suit. The U.S. construction industry stands alone in the world in retaining inch-pound units.

One thing is clear after more than 40 years of pushing metrics on the U.S. construction industry: International market forces, not the government, are more effective at mandating wholesale conversion in measurement systems. Apparently you can give Americans the metric system, but you can't make them swallow it. ■

Sue McCraven, NPCA technical consultant and Precast Solutions magazine editor, is a civil and environmental engineer.

¹Metrication is the conversion to the International System of Units (SI), a metric system of measurement, from a region's customary units of measurement, such as inch-pound.

²See "Steel & Concrete: Love at First Sight," Nov-Dec 2011 issue of Precast Inc. magazine, for an overview of CRSI.

³ACI is The American Concrete Institute. In 2003, ACI's Technical Activities Committee decided to maintain the inch-pound system of measurement in all its documents. For more information on the American Concrete Institute (ACI), see the May-June 2011 issue of *Precast Inc.* magazine for "ACI Strength through Consensus."

(who produce more than 90% of domestic steel) to make the changeover at minimal additional expense. CRSI is now in the process of making the appropriate changes to our manuals and literature.

With the rest of the world using the metric system, why doesn't construction make this seemingly logical conversion?

Risser: Because there is no incentive, no motivation, no market force pushing U.S. construction to use the metric system. It is important to understand that construction is not an "exportable" product. The U.S. liquor and pharmaceutical industries, for example, use dual units (both inch-pound and metric), because these businesses trade in the international marketplace where buyers use metrics as the primary system of measurement. There is a necessary mandate for metrics for industries that sell products globally. There is no market incentive or profit motive for the domestic building industry to use metrics.

If metrics never made sense for the building industry, why was there ever an effort to transition to metric units?

Risser: Money. In the '90s, the federal government mandate forced state DOTs to go metric if they wanted to be eligible for federal infrastructure dollars. The private construction sector (about 80% of all domestic construction) was never affected by the federal mandate and remained with inch-pounds, so private architects and engineers designing structures stayed with inch-pounds. This meant that contractors were forced to go from project to project, switching from metric to inch-pound units on the job site depending on the funding source. DOTs spent millions of dollars converting from inch-pound units to metric units. Money, not international pressure, was the only reason for federal-money agencies to convert to metric.

Even though there was a federal agenda for metrics, there was general public backlash to the metric system. Our speed limit signs remain in miles/hour, not kilometers/hour. We purchase gas in dollars/gallon, not dollars/liter, and so on. Does the typical person think of housing cost by sq ft or m²? How does a construction worker visualize concrete compressive strength – in psi or MPa?



How Fire-Safe is Your Precast Plant?

BY SUE McCRAVEN

Editor's Note: Canadian provinces each have their own Occupational Safety and Health regulations, and precasters in Canada should adhere to their respective laws. However, they generally mirror U.S. OSHA's regulations, so OSHA regulations are cited here as general guidance for all precasters.

Do you fight a fire in the shop, or do you head for the nearest exit? Can you use a combination A-B-C fire extinguisher on an electrical fire? What are common fire-safety deficiencies at precast plants? What specific advice do precast safety experts offer? This Safety Toolbox is a brief overview of fire safety procedures that will help you answer questions before you're in an emergency situation. For complete information on a plant Emergency Action Plan, visit U.S. OSHA's website.¹

Fight or flight?

In general, fire extinguishers should be used only by trained personnel to fight small fires (wastebasket) in the plant or on the grounds. If a fire is large (> 60 sq ft), is over the firefighter's height, is very smoky or hot (too hot to approach within the 10-to-15-ft range of the extinguisher), or if the fire involves flammable solvents, OSHA recommends evacuation. So, unless an employee is well trained in the use of a fire extinguisher (at least once-per-year training) and understands the different types of fires (electrical, wood and paper, liquid fuels), or if there is any

doubt about the safety of fighting a fire, the safest option would be to evacuate the building.

Some fire safety issues at precast plants

"Some of the key things to look out for are blocked or locked exits and egress routes," says Don Royer, area safety manager with Oldcastle Precast-New England, Rehoboth, Mass. The clear floor space at emergency exits can be a tempting spot to store plant materials or equipment when an employee is in a hurry. And while it might seem common sense to use a steel cable to secure a banging exit door with a broken latch, the plant's regulations for emergency egress must always take precedence.

"I know of one plant fire that occurred at night, so fortunately no one was hurt," says Chris Matson, vice president of Dura-Kast Products in Springfield, Mo. "That incident was caused by an electrical fire, and even though that fire started in an engine compartment, it is important that all plant staff know where the emergency electrical cut-off switch is and how to use it." Matson adds that they do not store any materials, flammable



"We encourage precast plant managers and owners to contact their local fire department in developing and practicing their Emergency Action Plan for fire safety," said Lt. Denny Hughes of the Farmington Hills (Mich.) Fire Department. Hughes also reminds precasters that all employees need to know where the emergency power shut-off is located and how to operate it in an emergency situation.

Photo Courtesy Farmington Hills Fire Department

or otherwise, in the room that houses the main electrical distribution system.

“Many precast plants have open work areas that are exposed to weather conditions like rain and snow,” says Alberto Ocegüera, safety manager for Jensen Precast in Arizona. “In order to prevent electrical shocks, electrical shorts or fires, plant safety managers must be aware of hazardous conditions related to weather.” Water or snow accumulation surrounding welding or electrical equipment can present a serious potential for electrical shorts and subsequent fires. All electrical tools, welding equipment and extension cords must be in excellent working condition with no exposed wires, well insulated and with good grounding. “Remember, water is the natural element with the highest electrical conductivity and, therefore, employees must take extra precautions when working with electricity in humid or wet areas,” he says.

Make friends with the local fire department

Taking advantage of the services offered by the local fire department or fire marshal is also good advice for any precast concrete business. “In our jurisdiction, the local fire marshal makes a biannual inspection of fire safety conditions in the plant,” says Matson. “If there is any emergency-plan deficiency, the fire marshal provides written notice and usually allows 30 days for corrective action.” The fire department will also check if there are adequate numbers of extinguishers in the facility and adequate, unobstructed egress at exit doors, he says.

“In commercial or industrial settings, safe egress is always an issue,” says Lt. Denny Hughes at the Farmington Hills Fire Department, Mich. “In manufacturing plants, door access, open aisles and unobstructed paths of emergency egress should be marked or taped on the floor so they remain clear of all obstructions in case of a fire.”

Hughes encourages businesses to contact their local responders for fire safety rules and building codes that apply to their jurisdiction and structure type. “Production plants also need to have an emergency response team within their work force to lead employees in times of emergency situations,” he says.

Here is a quiz on fire safety in the workplace that can be used during your regularly scheduled safety briefing or staff meeting. All are true/false statements and the answers are below.

1. A spark from welding or grinding operations in a precast plant can ignite oil-based release agents used on forms. **T F**

Answers

- 1. True.**
- 2. True.** Extra precaution should be taken by workers when operating power equipment (arc welding, cutting, grinding) outdoors. Make sure all electrical cords are properly insulated and grounded and that an operable and properly designated fire extinguisher is nearby.
- 3. False.** OSHA lists the four elements necessary for a fire as: fuel or combustible material; oxygen sufficient for combustion; a heat source (enough to raise a material to its ignition temperature); and the chemical reaction that is fire.
- 4. False.** Plant fire extinguishers and battery powered backup systems (for alarms and emergency lighting) need to be checked for proper charge once per month in many jurisdictions.
- 5. True.**

- 2. Welding, cutting and grinding operations that run on electrical power and take place in the open can become potentially dangerous when inclement weather causes the floor or ground surface to become wet. T F**
- 3. Four elements are needed at the same time for a fire to start. These elements are: fuel; light; a bare electrical cord; and the chemical reaction that is fire. T F**
- 4. Fire extinguishers and emergency backup power and lighting need to be inspected once per year. T F**
- 5. The A, B or C designation on fire extinguishers stands for extinguisher type: A = Air-pressurized water (APW) for ordinary combustibles (wood, paper, cloth, rubber); B = Carbon dioxide (CO₂) for fires in oil, gasoline, grease, solvents or flammable liquids; and C = Dry Chemical for fires in electrical equipment (fuse boxes, computers, wiring). T F**
- 6. When in doubt you can always use water to put out a gas or electrical fire. T F**
- 7. The National Fire Protection Association (NFPA) recommends that all employees in workshops or manufacturing areas have access to a properly working fire extinguisher within a 50-ft travel distance (29 CFR 1910.157(d)(4)). T F**
- 8. All employees should know where the main electrical shutoff switch is located and how to turn it off in a fire emergency. T F**
- 9. Newer plants with heat-sensor sprinkling systems must have both the fire suppression system and the fire alarm inspected by a professional agency at least once per year. T F**
- 10. The most important reason for inviting the local fire crew in to tour your precast plant for fire preplan purposes is that firefighters can learn the layout of the plant (including points of access, utility shut-off location, water supply locations and fire department connections) in case of fire. T F**

Sue McCraven, NPCA technical consultant and Precast Solutions magazine editor, is a civil and environmental engineer.

¹ www.osha.gov/SLTC/etools/evacuation/eap.html

- 6. False.** Never use water to extinguish flammable liquid or electrical fires. Water can spread a flammable liquid fire and can lead to electrocution in an electrical fire.
- 7. True.**
- 8. True.**
- 9. False.** Plant fire suppression systems in some jurisdictions must be checked by a professional agency on a quarterly basis. Check with your local fire department or fire marshal for the local building code and regulations that apply in your location.
- 10. True.** Mark Epps, Fire Marshal, Springfield (Mo.) Fire Department, says “If a fire were to occur in your plant, fire crews would already know the plant layout and how to gain access to the affected area, allowing for a quicker extinguishment of the fire and a reduction in the amount of damage.”

Trench boxes, shoring, sloping or benching are **MANDATORY** for trenches deeper than 5 ft.

Prevent Excavation Cave-in Fatalities

BY EVAN GURLEY

Editor's Note: Canadian provinces each have their own Occupational Safety and Health regulations, and precasters in Canada should adhere to their respective laws. However, they generally mirror U.S. OSHA's regulations, so OSHA regulations are cited here as general guidance for all precasters.

"Some people were trying to dig out the workers with their hands," said a Houston Fire Department officer recently at an excavation site in Texas where one worker suffered serious injuries and a co-worker lost his life when he was buried under tons of soil.¹ The young men were working on a drainage system in a 12- to 15-ft-deep, 8-ft-wide trench when the soil surrounding them suddenly collapsed. This is just one example of how proper planning and execution of an excavation/trenching safety plan could have prevented the loss of life.

Excavation and trenching are among the most hazardous construction operations, according to OSHA of the U.S. Department of Labor. Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in worker fatalities.

Despite having the knowledge and means to prevent fatalities, almost 40 workers die in trenching or excavation-related cave-ins in the United States – every year.² Lack of protective systems is the leading cause of trench-related fatalities, as reported by OSHA inspections; most occurring at depths of less than 10 ft.³ For precasters that do it all, including manufacturing, shipping and even the installation of underground precast concrete products, excavation safety measures should be addressed and implemented to prevent avoidable on-site accidents and injuries. The combination of loss of human life, fines, lawsuits and poor public relations could mean the end of a successful business.

Mandatory preparation saves lives: 12 critical questions

Whether you are shoring, trenching or backfilling, it is vital to approach every job – new projects and customary construction – with the utmost care and preparation. Many on-site accidents result from inadequate planning and execution of an excavation safety plan. Being reactive can ultimately lead to added cost to fix safety problems and can increase the possibility of a cave-in or other excavation failure.

Planning for excavation operations is one of the most important steps in avoiding accidents. Knowing as much as possible about the work site or job and the equipment and materials needed is essential, and important questions must be addressed prior to digging (taken from U.S. OSHA regulations):

1. Have all underground utilities and their estimated locations been accounted for (sewer, telephone, fuel, electric, water lines)? [29 CFR 1926.651(b)]

- Has the exact location of the installation been determined?
- Has the utility or owner been contacted?

2. Is there proper access and egress? [29 CFR 1926.651(c)]

- Structural ramps used for access or egress of employees must be designed by a competent person.
- Structural ramps used for access or egress of equipment must be designed by a competent person qualified in structural design and must be constructed in accordance with the design.
- Safe means of egress must be located in trench excavations that are 4 ft or more in depth so as to require no more than 25 ft of lateral travel for workers.

3. Will there be vehicular traffic exposure near the excavation? [29 CFR 1926.651(d)]

Employees exposed to vehicular traffic must be provided with and wear warning vests or other garments made of reflectorized/high-visibility material.

4. Is there proper protection from exposure to falling loads? [29 CFR 1926.651(e)]

Employees must not be permitted underneath loads handled by lifting or digging equipment.

5. Is there a warning system for mobile equipment? [29 CFR 1926.651(f)]

If mobile equipment is operating

adjacent to the excavation or when the operator's view is obstructed (does not have a clear and direct view of the edge), a warning system must be used (barricades, hand or mechanical signals, or stop logs).

6. Is there a potential for exposure to hazardous atmospheres?

[29 CFR 1926.651(g)]

- Preventive measures must be taken to prevent exposure to harmful levels of atmospheric contaminants (oxygen deficiency or hazardous substances).
- For exposure with less than 19.5% oxygen, proper respiratory equipment or ventilation in accordance with OSHA standards is required.
- For concentration of flammable gas exceeding 20% of the lower flammable limit of the gas, proper ventilation must be provided.
- Atmospheric conditions must be monitored when controls are used.
- Emergency rescue equipment should be available where hazardous atmospheric conditions exist.

7. Will water/water accumulation be an issue?

[29 CF 1926.651(h)]

- Employees must not work in excavations where there is accumulated water or water is accumulating unless

Mechanics of a Trench Failure

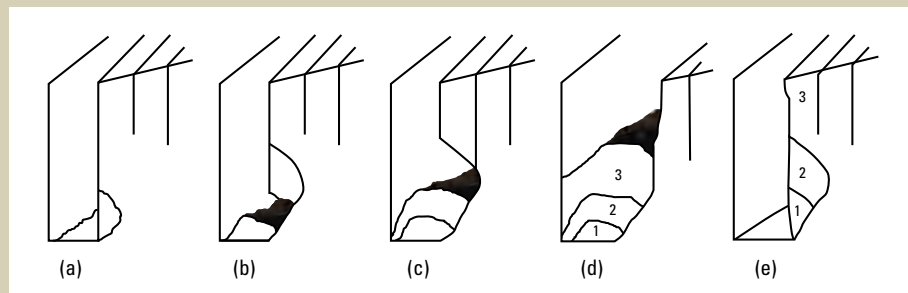


FIGURE 14

When a trench is excavated, the soil surrounding it is no longer stable. The soil may no longer be able to support its weight and the weight of any soil above. At the point where the soil can no longer withstand the pressure, the wall will shear and break away from its stable position, as indicated in Figure 1a. The first failure occurs as the bottom of the wall moves into the trench (see Figure 1b). This movement creates an undercut area at the base of the trench as soil along the wall falls into the trench. Often there is a second movement in which more of the wall material erodes. Finally, the erosion at the base of the trench leaves the upper part of the column supported only by cohesion to the columns around it (see Figure 1c), and more soil from the column will soon fall into the excavation (see Figure 1d).

Many people do not fully realize that soil is an extremely heavy material – 1 cu yd of soil can weigh up to 3,000 lb. or more, which is equivalent to the weight of a vehicle and is more than enough to suffocate or fatally crush a person.²



NPCA file photo

adequate precautions have been taken.

- If precautions are used (diversion, dewatering, special supporting systems or water removal), a competent person should monitor the removal operations.

8. Will the excavation be near existing structures? If so, what is the stability of the adjacent structures? [29 CFR 1926.651(i)]

Where stability of adjacent structures is endangered by excavation operations, support systems must be provided to ensure stability of such structures for the protection of the employees.

9. What types of soil will be found? [Appendix A to Subpart P- Soil Classification]

- It is necessary to know the characteristics of the soil at the particular job site (type of soil, water content of soil, previously disturbed soil).
- Follow OSHA Appendix A Soil Classification procedures to classify soils.
- Contact your county Soil Conservation Service office for a list of soil scientists in your area, or local geotechnical and/or soils engineers.

10. Is there adequate protection from loose rock or soil? [29 CFR 1926.651(j)]

- Adequate protection must be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Protection can consist of scaling to remove loose material, installation of a protective barricade or other means.
- Materials or equipment must be kept at least 2 ft from the edge of excavations.

11. If a protective system is needed, what type of system is adequate? [29 CFR 1926.652(a)]

Employees in excavations must be protected from cave-ins by adequate protective systems except when:

- Excavations are made in entirely stable rock
- Excavations are less than 5 ft deep and a competent person determines there is no indication of a potential cave-in.

12. If employee exposure to any hazard is anticipated, is there a plan in place to perform daily inspections of excavations, adjacent areas and protective systems? [29 CFR 1926.651(k)]

Daily inspections of excavations, adjacent areas and protective systems shall be made by the competent person to ensure a safe working environment.

Each of these questions should be answered during the planning stage of construction, following federal standards. OSHA 29 CFR 1926 Subpart P (OSHA 1926.651) thoroughly addresses each of these points and outlines proper procedures and minimum requirements for excavations. The competent person in charge of the excavation should fully comprehend the requirements laid out in the Specific Excavation Requirements section (OSHA 1926.651).

Design of Protective Systems for Trenches & Excavations

As defined by OSHA, protective systems include one or more of the following designs:

1. Sloping the ground
2. Benching the ground
3. Shoring the trench with supports (planking or hydraulic jacks)
4. Shielding the trench (trench box)

OSHA 1926.652 addresses the requirements for each type of protective system available. The competent person should, once again, read all the requirements laid out in this section and determine the appropriate protective system. The slopes and configurations of sloping and benching systems must be selected and constructed by the employer or designee in accordance with regulations. OSHA 1926.652 requires the following:

- Sloped no steeper than 1.5:1 (34 degrees); or
- Maximum allowable slopes and configurations per Appendix A & B; or
- Designs using other tabulated data; or
- Design by a registered professional engineer

Proper design, construction and placement of support structures will provide a safe work environment for employees. Designs for trench and excavation protective systems must be selected and constructed by the employer or designee. OSHA requires the following:

- 1926.652 Appendix A and Appendix C or Appendix D; or
- Using manufacturer's tabulated data; or
- Other tabulated data; or
- Design by a registered professional engineer

Things to remember during the job

- Just as outlined in the planning phase, inspections of the excavation, adjacent areas and protective systems need to occur each and every day before the start of the work day/ shift, after every rainstorm and throughout the day as needed.
- Notify all other subcontractors on site and notify them of the excavation location.
- Ensure all vehicles and machinery are kept at a safe distance from the excavation.

Conclusion

Trench cave-in deaths, like the recent tragedy in Houston, are avoidable through strict compliance with federal Occupational Safety and Health standards. The standards stress the need for a competent person to be in charge of all excavation and trenching activities at a job site. By following this critical advice and complying with the minimum requirements in federal standards, the majority of trench fatalities can be prevented. ■

Evan Gurley is a technical services engineer with NPCA.

¹Visit www.chron.com/news/houston-texas/article/Worker-s-body-found-after-trench-collapse-2448357.php

²BLS [2010]. Census of fatal occupational injuries (2000–2009). Washington, D.C., Bureau of Labor Statistics. Deatherage JH, Furches LK, Radcliffe M, Schriver WR, Wagner JP [2004]. Neglecting safety precautions may lead to trenching fatalities. *Am J Ind Med* 45:522–527.

³Arboleda CA, Abraham DM [2004]. Fatalities in trenching operations analysis using models of accident causation. *J Const Eng Mgmt* 130(2):273–280.

⁴Graphic abstracted from Mickle, 1991

OSHA Definitions

OSHA 29 CFR 1926 Subpart P concentrates on the industry minimum requirements and precautions that are enforced when performing excavations, addressing all open excavations made in the earth's surface, including trenches, in order to protect workers who labor in trenches. Strict compliance with all sections of this standard will greatly reduce the risk of excavation-related accidents. Some common definitions and terms should be reviewed before addressing OSHA 29 CFR 1926 Subpart P requirements. OSHA 1926.650 defines the following terms:

Cave-in – the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation. This occurs either by falling or sliding, in sufficient quantity so that it could entrap, bury or otherwise injure and immobilize a person.

Competent Person – one who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Protective system – method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Shield (Shield system) – a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with OSHA 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as “trench boxes” or “trench shields.”

Sloping (Sloping system) – a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent cave-ins varies with such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Trench (Trench excavation) – a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of the trench (measured at the bottom) is not greater than 15 ft. If forms and other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 ft or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

In Case of Emergency, Do Not Break Glass

Make 2012 the year your firm creates an effective crisis management plan.

BY BRIDGET McCREA

It doesn't take a tsunami or catastrophic fire to bring a manufacturer to its knees. Even minor emergencies and events can take their toll on a company's operations, sales, customers and suppliers. Getting out in front of these issues requires a well thought-out crisis management plan that addresses potential threats and shows owners, managers and staff members how to deal with the issues.

Unfortunately, crisis management planning isn't top of mind for many manufacturers. Many wait until a crisis occurs and then scramble to clean up the mess. "From my experience 95% of U.S. companies are either completely or seriously unprepared to manage a crisis," says Jonathan Bernstein, president of Bernstein Crisis Management Inc., Sierra Madre, Calif.

Small to midsized firms are particularly vulnerable, because they lack the board of director's guidance provided to their larger counterparts. Busy putting out daily "fires" and handling pressing tasks, owners and managers rarely put the time necessary into proactive thinking and planning on the crisis management front. Unfortunately, that way of operating puts manufacturers in a bad position when a product fails, a public relations debacle surfaces or a natural disaster occurs.

"If a big firm is hit, it may have the deep pockets to survive the crisis," Bernstein adds. "On the other hand, a single, nasty crisis – whether it is a reputation issue or the loss of physical facilities – can be downright devastating for the smaller manufacturer."

Thinking ahead

Awareness of the need for solid crisis management planning has grown over the past few decades. Events like the Tylenol capsule poisoning, the millions of gallons of oil dumped into the oceans by major oil companies, the extensive damage caused by Hurricane Katrina, and the earthquake and tsunami in Japan have all taken their toll on North American businesses.

Last year, the global crisis management sector hit a new low record when it posted total losses of \$265 billion for the first two quarters of 2011 alone. That exceeded the previous record of \$220 billion set in 2005, according to Munich Re, a global firm that insures insurance companies. A significant portion of that impact can be tracked right down to the state, regional and local levels, where companies of all sizes and across all industries reported operational and revenue losses as a result of the events.

Digging down into the precast industry, there are several situations that call for solid crisis management planning. Here are a few examples that could crop up on any given day:

- A newspaper reporter calls your plant's main phone number saying that an environmental group is targeting the area's biggest polluters and your plant is on the list because you use cement.
- One of your drivers overturns a load of precast on the highway and a reporter is on the phone with one of your top salespeople.
- You have a serious accident at the plant and a worker goes to the hospital.

- A camera crew shows up unannounced at the plant office and asks to shoot some “B” roll footage.
- OSHA shows up with a local reporter trailing along, looking for information about just how safe your plant is for workers.
- Immigration conducts a raid at your plant based on information it received on your employment rolls.
- A precast panel you manufactured 10 years ago falls off the top of a building and kills someone.
- A bridge piece fails and the contractor is blaming faulty precast construction for the problem.

The list of possible scenarios a precaster faces is virtually endless. In each of these incidences, your employees, family members (particularly when an accident has occurred), the media, the community and the regulatory bodies will be looking for answers.

When the questions arise, Thomas S. Paccioretti, principal at Newport Beach, Calif., crisis management consultancy Broadway Advisors LLC, says honesty is the best policy. “Tell the truth,” says Paccioretti. “Tell it all and tell it now.” In the case of product liability issues, for example, he says any lies or untruths that are told will eventually come back and cause even greater problems for the manufacturer.

“Even if the truth is, ‘We didn’t know anything about it,’ tell it like it is,” Paccioretti advises. “Your company may still take a hit in terms of lost revenues and customers, but you can salvage the situation over time if the people around you know that you told the truth.”

Strong alliances pay off

At Sherman-Dixie Concrete Industries Inc. in Nashville, Tenn., John Higgins II, director of operations, says his team keeps a close eye on potential threats to the firm’s health. With 300 employees working at 10 locations in four states, Higgins says the precaster has formed strong alliances with local firms that can “kick into gear” when equipment failures, power outages or other crises threaten Sherman-Dixie’s operations.

“We recently had a mixer go down at one plant that wound up unable to make concrete,” says Higgins. “We reached out to our contacts at local ready-mix companies and got production back online within an hour.” The precaster used a similar strategy when a bridge crane ceased operation recently at one of its Tennessee plants.

“We called a crane company that brought in the equipment we needed to be able to get by until ours was repaired,” says Higgins. “Through advanced planning we’ve found very effective ways to maneuver around catastrophic equipment failures.”

On the PR front, Higgins says all media-related phone calls are routed to the firm’s corporate offices in Nashville. “If something is going on that would garner media attention, our employees know not to talk to reporters,” says Higgins. “All of our plants are within three hours drive-time from one another, so I and/or our owner can mobilize quickly to deal with such issues.”

To other precasters who are assembling their own crisis management plans, Higgins says to start by looking at the critical areas of the factory and then seeking outside partners who can help when those critical functions fail to operate as expected. “When we acquire a new facility,” says Higgins, “the first thing we do is look at which local firms can help us out when something goes wrong.”

Creating a roadmap

A crisis management plan is something that Bernstein says every manufacturer should have in place. Formulating such a plan needn’t be expensive or time consuming, but there are several elements that must be included in order for it to be effective. “It is far more cost- and resource-effective to prevent crises, or minimize the chances of crises occurring, than to merely respond to them,” says Bernstein, who divides the crisis planning process into the following four major components:

1. **Vulnerability/risk assessment:** A multidisciplinary risk assessment determines current and potential areas of operational weakness and strength and solutions, because identified weaknesses may result in emergencies or crises of varying magnitudes if not corrected. When working with clients, Bernstein’s team examines every functional area of an organization to identify anything that could lead to a significant interruption in business and/or reputation damage.
2. **Analyzing and reporting results/writing crisis plan:** Once the vulnerability/risk assessments are conducted, firms should use the results to identify challenges to effective crisis prevention and response – human or systemic – and come up with ways to overcome those challenges. Mobilize a crisis communication team (made up of key managers, owners and employees) to review and modify the recommendations. The team should also discuss scenarios that are most likely to affect the organization and come up with a final list of “most likely” scenarios. Using that information, the team should create a manual that will “guide the entire organization in the communication aspects of responding to crisis situations,” says Bernstein. Be sure to include clear delineation of individual responsibilities and draft responses that reflect the organization’s values while considering the public’s sensitivities and need to know.
3. **Training.** Employee and manager training is one of the most important components of any crisis management plan. Break down the training into these categories:
 - **Executive/management orientation.** Most employees at the executive and/or management level know how to prevent or respond to crises operationally but are less certain or even ignorant of how to prevent or respond to crises from a public relations perspective, says Bernstein. He suggests conducting a two- to four-hour training

session to prepare senior staff members (and to distribute and discuss the crisis plan).

- **Employee orientation.** Every employee who will be associated with implementing a crisis plan should receive a basic orientation on the content and purpose of that plan.
- **Media training.** “A media interview is completely different from any other type of interview with which most people are familiar,” Bernstein warns. “There are different rules, different goals and different ways of exchanging information.” Through proper media training, organizational spokespersons can “optimize the results of anything from friendly to extremely hostile interviews by print, radio or TV reporters,” he adds.

Getting Management On the Ball

James Lukaszewski, president of crisis management firm The Lukaszewski Group, says prompt, effective crisis response depends on five essential responsibilities that must be carefully spelled out for top executives. He breaks these responsibilities down as follows:

- 1. Assert the moral authority expected of ethical leadership.**
No matter how devastating a crisis is, in most cultures forgiveness is possible provided the organization, through its early behaviors and leadership, takes appropriate and expected steps to learn from and deal with the issues.
- 2. Take responsibility for the care of victims.** The most crucial element in crisis management, aside from ending the victimizing event, is managing the “victim dimension” (which includes people, animals and living systems). Top management is responsible for taking appropriate steps to care for their needs.
- 3. Set the appropriate tone for the organizational response.**
Tone is determined by management behavior and helps the organization meet the expectations triggered by a crisis. If senior management is defensive, the entire organization will be too.
- 4. Establish the organization’s voice.** Put a face and a voice on the organization as it moves through the crisis for external audiences. Tell how you describe the organization, what you are doing, how the response is going, what responsibilities you are taking and what outside scrutiny you are inviting. Use positive language, be helpful and suggest early resolution. Avoid demeaning or discrediting anyone.
- 5. Lead at every level.** Leaders need to act like leaders during urgent situations. Have leaders walk around and talk to people. Focus everyone on the ultimate response process goals. Ninety percent of senior executive activities should have executives out being leaders and motivators of empathy, not huddling in their offices.

4. Crisis plan testing and validation through emergency exercises and simulations. How well will your crisis plans, and the people charged with executing them, perform when the next crisis strikes? “The best time to answer that question is before the crisis strikes,” says Bernstein, who advises precasters to conduct and/or oversee realistic simulations of crises that could affect the company. The most effective exercises and simulations range from discussions that take place in a meeting room to realistic crisis recreations involving people and equipment at one or more locations. Such drills can be particularly effective, says Bernstein, and should involve management, staff and/or emergency personnel who will test out hypothetical emergencies or crisis scenarios (such as a plant accident or a company-wide power outage).

The precast manufacturer that hits on all four areas listed above is the one that will be best prepared in case of emergency – be it a minor power outage, a product failure or a full-scale natural disaster. Ignore this important aspect of your operations and your firm could wind up dealing with major revenue losses, plant closure, lawsuits and even business cessation.

“Unfortunately, companies are generally underprepared for the adverse circumstances they may face,” says James Lukaszewski, president of crisis management firm The Lukaszewski Group in Mount Kisco, N.Y. He estimates that 75% of Fortune 500 firms lack viable crisis management plans and says simply assessing a business’ day-to-day activities can go a long way in getting the planning process started.

“Look at your precast products and their potential weaknesses and vulnerabilities,” says Lukaszewski. “From there, you should be able to come up with a good idea of what operating problems could result in product failures and then take the steps necessary to mitigate these issues.” Going beyond products, he advises precasters to consider issues like employee violence, sexual harassment and other employee-related situations that could have a severe impact on an individual company.

“Those are the problems most companies are reluctant to prepare for,” says Lukaszewski, “and there’s really no school that teaches manufacturers how to deal with this stuff.”

Finally, Lukaszewski says virtual problems (such as those caused by angry customers blogging online or using sites like Facebook to vent their frustrations) also need to be taken into account in today’s information age. “The Web is a huge deliverer of bad news and anger and serves as a platform for people to complain, bellyache and adversely impact companies,” says Lukaszewski. “Don’t forget to factor this into your firm’s crisis management plan.” ■

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

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Restoring 'Living Shorelines'

As environmental threats deplete the world's reefs, precast concrete offers cost-effective and workable methods for restoring them.

BY DEBORAH HUSO

While it's not unusual for precast concrete to be a component of "green" commercial building projects, often helping architects and builders earn points for LEED certification, precast has also been lending a hand on the environmental front through natural habitat-restoration projects. In recent years, environmentalists around the world have been incorporating precast concrete into the construction of artificial reefs, restoring habitats for marine life and protecting fragile coastlines from storm devastation.

Why restore "living shorelines"

The Nature Conservancy is involved in several such projects, including a number of oyster reef restorations in the Gulf of Mexico. According to Amy Smith Kyle, project manager for the Louisiana Field Office Coastal Conservation, scientists at the Nature Conservancy have found that 85% of the world's oyster reefs have been lost. "These reefs provide a lot of ecosystem services," she says. "They make for fantastic fish habitats, and they're natural coastal buffers that help break up wave energy." Oysters are also filter feeders, meaning their presence in the ecosystem improves water quality. "They're essentially living shorelines," Kyle adds.

The importance of oyster reefs to the ecosystem, where they provide habitat for juvenile fish, shrimp and crab – and protect human populations on the coast during hurricanes and other severe weather events – has led The Nature Conservancy to initiate a number of reef restoration projects along the northern

Gulf of Mexico. The conservation group is placing artificial reefs where oyster reefs have historically been located.

Testing precast in Vermillion Bay

In Vermillion Bay off the coast of Louisiana, the Conservancy is testing precast concrete in its restoration of oyster reefs along the National Audubon Society's Paul J. Rainey Sanctuary. The Conservancy is using a patented Oyster Break system developed by Wayfarer Environmental Technologies based in Hunt Valley, Md. Wayfarer's Mike Turley explains that the system basically looks like Olympic rings sitting in the water. The system of rings is designed to perform several functions, including protection of the coastal shoreline from erosion.

The precast concrete rings measure 5 ft in diameter. The first phase of the project was completed in October 2010 with the placement of 670 linear ft of rings. The second phase began in the summer of 2011 with the installation of another 685 ft, and the third phase will add 1,700 more ft. "A big part of this project is trying to see what types of oyster reef restoration projects work best in which habitats," Kyle explains.

To attract oysters to the precast rings, Wayfarer adds a proprietary organic mix to the concrete. "We have a high attraction rate," Turley says. "Oysters tend to attach themselves at the ends of the shelves, so you actually end up with higher-density reefs. The bigger the structure gets, the bigger its capacity to deal with storm surge."

Wayfarer is the provider of the molds for the precast rings,

and with each project, the company brings the molds to the local area and uses local precast concrete manufacturers to cast the rings, which weigh in at one ton apiece. To install the rings, contractors use an airboat with a crane boom or standard barges with excavators that position the rings in the water. The ring design in Vermillion Bay consists of six segments of 225 linear ft, each with a 100 ft break in between each segment.

Why precast works

The reef production process is fairly quick. Turley says precast manufacturers pour concrete into Wayfarer's forms, which can then be broken in two to three hours. "That avails itself to just-in-time delivery," he points out, "and also reduces standing inventory requirements." The rings are generally ready to ship within 10 to 14 days. Turley says he can get any reef project going in as little as 30 days.

Turley feels precast concrete offers some distinct advantages. "You get much better consistency and strength from precast, and it also minimizes transportation costs," he says.

Precast also offers flexibility in mix components. "We can use different size stone and admixtures, allowing us to custom design for particular habitats and customers," Turley notes. His company is able to fine-tune the concrete mix profiles based on local aggregates.

Turley says precast also offers weight capacity that keeps the rings in place. They are not easily shifted by waves or storm surges. At the same time, the rings offer a lot of flexibility in design.

While it's still too early to make any definitive assessments on the effectiveness of the precast concrete oyster reefs in the Gulf, Kyle says oysters are attaching in Vermillion Bay. "They seem to really like the texture of the product," she says.

Reef balls offer solutions worldwide

Precast concrete rings aren't the only method of artificial reef restoration being used. The Reef Ball Foundation,

based in Athens, Ga., has helped place precast concrete reef balls in more than 4,000 reef restoration projects in some 60 countries. Their projects include not only oyster reef restoration but coral propagation and planting systems, estuary restoration, mangrove restoration, and beach erosion control projects.

Like Wayfarer, the Reef Ball Foundation, in partnership with Reef Innovations Inc. in St. Cloud, Fla., has a variety of molds that are shipped to the reef restoration site. A local precaster then fills them with concrete, micro silica and aggregate, which cures for 24 hours. The foundation also sends its clients additives like the micro silica, which increases the reef balls' durability and strength and establishes resistance to corrosion. Adva Flow is also added to the mix to keep the reef ball pH low so it's close to that of seawater. Microfibers added to the concrete create a rough texture to encourage organisms to attach. With most of the weight at the bottom of the balls, they are also less likely to shift during severe weather events.

Kirbo says the balls are especially useful in coral reef restoration because they mimic the limestone boulders to which organisms attach.

Currently, the Conservancy has placed a total of 3,500 reef balls in and around Mobile Bay. "The Reef Ball Foundation and Reef Innovations have been around quite awhile and have had success with oyster attachment," DeQuattro says. He says the reef balls provide particularly good habitat for fish, since they are hollow and filled with holes.

"In the old days of artificial reef creation, people put down trash, tires, ships and cars," Kirbo explains, "but those things all shift under water and have toxins, too," adding that precast concrete offers a much more environmentally friendly and stable option for reef restoration. ■

Deborah Huso is a freelance writer who covers home design and restoration, sustainable building and design, and home construction.

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STORY AND PHOTOS
BY RON HYINK

A FLORIDA PRECASTER NAVIGATES
A ROUGH START AND A TOUGH ECONOMY
THROUGH PERSEVERANCE
AND PERSONAL RELATIONSHIPS.



Bob Snowe reflects on his beginnings as a precast manufacturer with a mixed bag of amazement and amusement. After all, he did have a particularly meager start back in his 20s, and the peculiar events that suddenly propelled him into prosperity come as a mystery to him to this day. But even after building up American Concrete Industries Inc. of Fort Pierce, Fla., through the years into a reputable and successful manufacturer of sanitary and stormwater products, he still misses the daring and adventurous days of his youth.



BOB SNOWE IS THE OWNER OF AMERICAN CONCRETE INDUSTRIES INC. IN FORT PIERCE, FLA.


ANGLING FOR BUSINESS

Looking out at a relative calm ocean from the cozy cabin of his deep-sea fishing boat, Bob weaves together his story with an occasional stitch of humor. Above the drone of the vessel's dual diesel engines powering up to search for a more promising fishing spot in the Gulf Stream, he talks about the time when his first and only product was a 20-in.-square precast yard drain box wrought out of wooden forms.

He had no money for a precast shop of his own – Florida considered it heavy industrial and wouldn't allow a startup precaster to set up in a back yard. And besides, even if he had his own shop, nobody would bother to deliver the trifling 1 or 2 yds of concrete he needed per day. So to get started in the business, he was relegated to leasing a small patch of real estate in the back lot of a ready-mix plant, where he could get all the concrete he needed when he wanted it.

A small patch of land was all he got – nothing else came with it. All he had in the way of an office was a log to sit on. "I didn't even have any chairs out there," recalled Bob. Whenever his clients dropped in for a visit, they would sit on the log and chat with him as the clouds drifted along overhead. "Most of the companies seemed intrigued by it, and they'd come out to see how I'm doing on such a small budget," he said. "They liked the product and all, and that's what sold it to them."

His new enterprise really did look rather spartan. The ready-mix yard sat right next to a marina, so Bob started to make friends with some of the boat captains who would come over to visit with him on his log. None of them could figure out how he could make a living at what he was doing, so they joked that someone should give him some fish at the end of the day.



“We were happy back then. We didn’t realize it at the time. Looking at it now, those were pretty good days.”

– BOB SNOWE

Reflection

One day the big boss of the ready-mix company came all the way from England to visit the plant, and soon came out to have a talk with Bob. They sat on the log and talked for a while, and then the big boss asked him to lunch. “We went to lunch, and some of their employees resented it and wanted to know why I went to lunch with him,” said Bob. They thought Bob was spying on the company, because surely he wasn’t doing this job for a living. “It was like, ‘You’re not fooling us!’” Bob recalled, laughing.

Working half a day (“I considered it full time, but it’s all the work we had,” explained Bob), he and a helper had to make do with what they had. With nowhere else to work but the great outdoors, work had to be done even on dismal days with misting rain. “We’d be out welding in the rain and getting shocked,” recalled Bob, adding that when one got zapped, the other would take over until he got zapped, then they’d trade places again. Not exactly OSHA-compliant by today’s standards. “But you know, you’re going back in time, too, when rules weren’t so stringent.”

And yes, Bob looks back on those days with great fondness. “We were happy back then,” he said. “We didn’t realize it at the time. Looking at it now, those were pretty good days.”

NOT A FISH STORY

Bob grew up working at his father’s precast plant of the same name in Maine (no current affiliation), so he could have dived right into the deep end of the industry. Instead, he slowly tested the waters in the shallow end after landing in Florida.

With no ill feelings toward his father or the company, Bob wasn’t really happy in Maine. Had he stuck





it out there, he likely would have taken up the reins of his father's company at some point, yet he made a conscious decision to leave it behind for a different path in life. And so, he became successful in the precast industry by first walking away from it.

Armed with an engineering degree and a little money to live on, Bob landed in Fort Lauderdale, Fla., to link up with some college buddies. It didn't take long for the money to run out, and he still had no job. He found work at a small precast plant and really enjoyed his job of inside sales and helping convert paperwork into product. But after a few months, he realized the company was not interested in growing. "My future was very limited there if they wouldn't grow," said Bob. So he gave them a three-week notice – and ended up staying 10 more weeks, because the company kept asking him to stay a little longer, and besides, he had nowhere else to go. "But finally it was time to move on," he said.

Bob found work at another precast plant, but he stayed only two weeks when he decided to strike out on his own. He still had no money, plus he was from out of state and he had no real contacts in the industry to help him get started. But he did have some smarts and the determination to succeed, and that's how he ended up in the back lot of the ready-mix plant with a log for his office.

Bob really wasn't making any money with the small yard drain boxes, "but I liked going to work every day, I liked the few people I dealt with," he said. For a time he had to supplement his income with a part-time job that paid cash at the end of the day. After a few years, he finally had enough money to buy a couple of steel forms from which he could make a few small catch basins and sanitary manholes.

And then something bizarre happened. A man from one of the other established precast manufacturers came to Bob and offered whatever amount of money he needed to

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move, wherever he wanted to move, in an irrational effort to eliminate the competition. Bob at first had no idea who this person was or why he thought Bob posed a threat. "Here's a guy making yard drain boxes, and you're that worried about him?" Bob asked incredulously. Bob shrugged it off, and then things went to a whole new, crazy level. Unbeknownst to Bob, the company went out to all its contractors and declared that if they did business with Bob, then the company would refuse to sell its products to them.


Well, it backfired. Orders came to Bob from out of nowhere. "I had more sales than I could deal with," he said. People would come out to see who this person was, this big threat to the other company, to see for themselves that such a person actually existed. "They wanted to know who I am," he said.

The other manufacturer eventually went out of business, most likely from having lost so many of its contractor customers. From that, Bob quickly built up his business and soon had the financial backing he needed to buy 10 acres of property and to put up a precast plant of his own – a real office with a real desk and chairs. His built a 50-ft by 100-ft shop with overhead cranes, then doubled its size after a couple of years.

NET GAINS

Closing in on a new fishing spot, the 56-ft craft made a small course adjustment as Bob continued his narration. Although he had grown up working in a large precast plant, Bob had never gone out to a job site. That all changed as he was building his own company up from its bare roots.

As he went out to the job sites and got to know the foremen, Bob began to learn how the product is installed. He became aware of the difficulties they ran into, and gained some ideas for making the whole process easier for them. Bob explained that a manhole may seem like a basic item – everyone makes them – but they can be customized for each customer. "Some foremen like a bigger hole, some want them really tight," he said. "Some people like lifting holes in the manholes, some people want the lifting hooks in the bottom." Some want the base and riser in



"I built a lot of relationships with people that were young foremen for contractors at that point who are now running the companies that we sell to today, which is really key to why we're doing well today."

– BOB SNOWE

Loyalties

one piece, while others can't handle the weight. "So it seems important to me, once you get the order, is to sit down with them and go over how we're going to do it."

Bob would learn what the different foremen were like so that when he got a job, he would ask to speak with the foreman to go over the shop drawings. "And boy, they loved it!" he said. Now the foremen were getting the holes where they wanted at the angles they wanted and at the sizes they wanted, he said. It paid off not only in terms of a customized product, but he was forming strong bonds that continue to pay dividends today.

"It made a huge difference, the loyalties I built up with those

foremen," said Bob. "I built a lot of relationships with people that were young foremen for contractors at that point who are now running the companies that we sell to today, which is really key to why we're doing well today. In today's market, you can order from at least three or four companies that do what I do, and there's no good reason to buy one over the other." But the difference for Bob goes back to the time he spent early on in the field. "Those personal relationships matter a whole lot."

All that loyalty coming back to him now is the sustenance that has been getting him through since the high-revving economic engine threw a rod. While he did have to downsize and let some people go, he kept as many employees as he could. He is still very cautious about investing in more equipment or new technology and what it would mean for his employees. An example is his decision to stick with conventional concrete rather than putting his money into self-consolidating concrete (SCC).

"SCC is a very good product. It cuts down your labor significantly – it's very quick and easy," said Bob. "But it does cost more money, and when you're trying to retain employees, you're better off, we felt, to stay with the regular concrete." In a tradeoff between technology and employees, it is the employees who win out. "So we were able to keep more employees without having to do additional layoffs."

Fortunately for Bob, he had little debt when the economy cracked. "When this downturn happened, we didn't have a lot of loans out," he said. "Everything we had we could cover. If we did have them, I'd have to shut it down."

Another business decision that has helped keep American Concrete Industries afloat is sticking to a quality control program to make its operations more efficient. The rapid growth began to create new issues that had to be dealt with. "The pieces weren't all fitting together at a certain point," said Bob. "We had a hundred little problems."

Signing up for the NPCA Plant Certification Program was the first act Bob took on a mission to eliminate wasteful production practices. "It went very well for us – eventually," he said, remembering what happened at his first inspection. "We failed miserably. I think the inspector was fairly kind with us. He gave us not a passing score, but an encouraging one, like 'If you try you'll get there' kind of score."

They did try, and it paid off. "That program took all the little fire drills out of our company," said

Bob. "It made a huge difference for us. The quality was back up, all the fire drills were going away."

One of the major factors of the program for Bob was putting together his own plant-specific QC manual. "We've written and rewritten it several times over the years. It works, it's continually being revised as products change," he said. "But that program really brought all the pieces together for us."

CATCH OF THE DAY

Arriving at the new fishing zone, the big diesel engines scaled back to trolling speed and the drag lines were cast out again. But alas, there was not much happening here either – a few "inquiries" but no serious offers. After some time of inactivity, Bob reluctantly made the call to head back to shore.

It was a disappointing day for a fishing expedition, yet at the same time it was a gratifying experience. Bob sees life as being a lot like that – the exhilaration of getting up early in the morning and starting a new day doing something you love. That's what keeps him going, and you might even say it's what keeps him in business. ■

Ron Hyink is NPCA's managing editor.



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Management Wisdom

Get the most from yourself, your company and your people.

BY WILLIAM ATKINSON

Thousands of management books are available that can provide excellent information on how to run a business successfully. However, most tend to focus on specialized and coordinated philosophies and strategies. What is often lacking are books that share the accumulated wisdom of successful managers who have learned some keys to success that don't fit neatly into specific categories.

With this in mind, four NPCA leaders share some practices that have helped them over the years.

DAN HOUK, president and CEO of Wilbert Precast Inc., Spokane, Wash.

"I have spent some time thinking about employee relations – how I treat employees and how to get the most out of them," he says. "I learned quite a bit about my management style from a book called *StrengthsFinder*."

One thing Houk realized that he has done over the years, without thinking too much about it, has been to find what is

best in people and bring out these strengths, rather than trying to change them and get them to mirror his own personality and style. "In other words, I let them manage and work with their own styles," he explains.

"After a year or so, once I have learned their particular styles and strengths, I try to work with them and encourage them to become even stronger." He has found this more successful than hammering on the little things that they may not do as well. He may even shift their responsibilities so that they can avoid the things they don't really do as well.

"I think this may be one of the reasons that we keep our management people as long as we do. Most of our managers have 23 to 27 years of employment, and most of our office staff has between 10 and 27 years with us."

Certainly, Houk will fire people if it is necessary. However, it takes a lot to get fired. It usually relates to an attitude problem. "If someone has abilities with a good attitude, I always try to find a place, even if it involves restructuring," he explains.

"I have even given some people demotions over the years, because they just couldn't do what I was asking them to do. Rather than fire them, I put them in new positions where I felt they could thrive."

Houk also likes to focus on diversification and change in his company. One thing he has done over the past 30 years has been to constantly diversify into new products that he has identified as being a need in the marketplace. "We continue to move forth with confidence that we will continue to find other new products and grow our business by offering more categories of products to customers to choose from," he explains.

In addition, he always likes to look at change in general. "We are not a company that remains idle," he says. "If we have always done something a certain way, that becomes suspect. We want to take the time to consider new ways of doing things. In sum, we don't cherish the status quo. We challenge it all the time."

BRENT DEZEMBER, president of StructureCast, Bakersfield, Calif.

"We always try to be a customer-focused company," he says. "We have developed a long-term plan and strategy to achieve this." Management also creates short-term plans and reviews them on a regular basis.

Key to this strategy are daily meetings designed to identify problems that are occurring with projects. Each day, Dezember participates in a management huddle, an operations huddle and a sales huddle, all designed to keep people focused on goals and targets and to address any issues that have arisen. On Mondays, each huddle may last 30 minutes. On the other days, they are usually 15 minutes or less.

In the management huddle, the team reviews project budgets and any customer issues. "We discuss anything that is 'bad news' from the day before or something that is not according to plan," he says.

The production huddle also looks at glitches. "For example, 100% of our products are custom," says Dezember. "We have found that if someone in the yard makes a decision on the fly about a product outside of the huddle, in most cases it is going to end up being wrong."

The sales huddle is almost always focused on customers and how the company can be different from its competitors.

"Work night and day to get the best people you can find," he suggests. "You can't soar with lemmings. You can only soar with eagles." Dezember has found that if you run a measurement-centered organization, not everyone is going to fit in, and not everyone is going to perform the way you need. "I am always looking for good people," he says. "In fact, I always look for people who are better than I am."

When hiring for a management position, there are a minimum of five interviews. "We have set questions on each of those five interviews, so applicants have to pass a hurdle each step of the way," he says. The first two interviews don't even focus on the job. Dezember wants to find out what kind of person he

is dealing with. "There are a lot of phony people out there, and most people in an interview will try to sell themselves to you," he explains.

As a result, in the first interview, he doesn't even let the person ask any questions. "We have 20 questions, and we don't deviate," he says. "If they start to ask us questions, we don't invite them back to a second interview, no matter how qualified they may seem to be." During the second interview, he tells them that he wants them to ask 20 questions. If they don't ask 20 questions exactly, they aren't invited back for a third interview. "We have found that people who do well in the first two interviews tend to end up being the best managers," he says. "In most cases, we try to interview five people to find one person."

ERIC BARGER, president of C.R. Barger & Sons Inc., Kingston, Tenn.

It is OK to look to other, more experienced precasters for advice and guidance. "There is always someone in another part of the country who is doing something you have probably not heard about," Barger explains. He has found that it makes sense to call other precasters out of his competition geography and ask them how they make a certain product, or how they handle a certain situation. "You can learn 40 years of information in two hours doing this," he says. "This week

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alone, I talked with three different precasters."

If you can't read and/or understand your own financial statements, learn to do so. "A lot of precasters don't know how to do this, and I was one of them at one time," he admits. "However, since then, I have learned how to do this." One way he recommends learning how to do this is to find another precaster whom you trust, particularly one who is successful and knowledgeable on the business end. "This person can go through and show you what to do and what to look for on financial statements," he says.

What gets measured gets done. Barger has found that if you

consistently track certain goals, people learn that you're paying attention to these and begin to pay attention, too. These can involve production goals, sales, delivery times and efficiency levels. "We don't measure everything, but there are five or six things that we monitor on a regular basis," he says.

Be involved at all levels of your company. "I sweep floors every now and again in my plant," he says. "I was brought up this way. It's good to sweep every once in awhile, and it's good to deliver every once in awhile. It's a good way to hear what's going on, and you can stay current on what is going on in the company, instead of being isolated in an office."

STEVE RODGERS, general manager of Contractors Precast Corp., Davidson, Md.

"I have been involved in this business for over 40 years," he says. "I have always believed that you have to provide a quality product, superior service, and you have to be able to meet contractors' schedules." To do this, he has found, you have to really be involved in their operations to understand what they need, when they need it and how they need it. "These things help you to develop long-term relationships with customers, and, over time, you may actually end up in a way running their businesses for them," he says.

Along the same lines, it is also important to be organized if you want to get things done correctly and in a timely manner. "We get a set of plans, schedule production and so on, and we follow these," he explains.

It is also very important to try to keep your good employees. "You need a staff that really understands what they are doing," he says. To achieve this, you need to develop positive working relationships with key people. Rodgers tries to keep them happy. In addition, as they move up the ladder, it is important to continue to reward them. "We have turnover among lower level employees, just like everyone else," he says. "There are always people who will change jobs for 10 cents more an hour. However, we tend to be successful in retaining our key people." ■

William Atkinson, Carterville, Ill., is a freelance writer who covers business and safety issues.

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green PIECE



'Heat Islands' Are No Tropical Paradise

Dark manmade structures that absorb solar energy can create undesirable heat loads in cities. Precast concrete can help reduce urban heat islands with its "cooler" white surface.

BY CLAUDE GOGUEN, P.E., LEED AP

The term "heat island" may evoke pleasant images of summer campfires and good times. However, the "heat island effect" is anything but pleasant, causing problems in urban areas. The good news is that efforts are underway to reduce this phenomenon of spiking temperatures. Sustainable precast concrete elements with cooler, lighter-colored surfaces can reduce these undesirable heat island effects.

A heat island is an area of higher temperature, or localized temperature spike, in a region of cooler temperatures. Heat islands occur where there are dark exterior surfaces (such as black roofs and dark asphalt pavements) and a lack of vegetation. The higher temperature, or heat island effect, is the result of dark-colored constructed surfaces absorbing solar energy and retaining heat, which in turn raises urban temperatures and increases building cooling loads and energy costs. Heat islands also have an adverse effect on microclimate and local human and wildlife habitats.

Solar reflectance

Precast concrete buildings, cladding, pavers and other elements can contribute to reducing heat islands. A recent laboratory study shows that concretes typically used in the United States have a solar reflectance index (SRI) that meets the criteria of the LEED Sustainable Sites Credit for reducing heat islands. But what is solar reflectance?

Solar reflectance (SR), sometimes called albedo,¹ is a measure of a material's ability to reflect sunlight (including the visible, infrared and ultraviolet wavelengths) on a scale of 0 to 1. An albedo value of 0.0 indicates that the surface absorbs all solar radiation, and a 1.0 SR value represents total reflectivity.

Dark-colored materials generally have a low solar reflectance,

meaning that dark surfaces absorb heat from the sun and warm the air through convection. Lighter-colored materials (such as precast concrete) generally have a higher SR, as they reflect heat from the sun and do not warm the air as much. Shade, from trees and buildings, and the natural process of water evaporation from the surface of plants also help keep the air cool.

A recent study conducted by scientists at Lawrence Berkley National Lab found that after parking in the sun for an hour, a silver Honda Civic (shell SR = 0.57) had a cabin air temperature about 9 to 11 F lower than an otherwise identical black car (shell SR = 0.05). However, color is not always a reliable indicator of solar reflectance, because color represents only 47% of the sun's energy at the earth's surface. The remaining 53%, which is invisible to the human eye, consists of ultraviolet (3%) and infrared (50%) radiation.

SRI is a composite measure of a surface's solar reflectance and emittance and is measured on a scale of 0 to 100. Emittance is a measure of how well a surface emits (or releases) heat after it has been absorbed.

In LEED-NC (New Construction and Major Renovation), two points are available for reducing heat islands. One point can be earned by using paving materials with an SRI of at least 29 for 50% of the site hardscape (including roads, sidewalks, courtyards and parking lots); this is "Sustainable Sites Credit 7.1: Heat Island Effect: Non-Roof." Another point can be earned by using roofing materials with an SRI of at least 29 for steep-sloped roofs and SRI \geq 78 (for at least 75% of the roof surface) for low-sloped roofs. This is "Sustainable Sites Credit 7.2: Heat Island Effect: Roof."

Since concrete has an emittance of about 0.90, it needs to have an SR of at least 0.28 to meet the criterion of an SRI of 29 and at least an SR of 0.64 to meet the criterion of an SRI of 78.

How to use precast concrete for LEED credits

How can precast concrete structures help in achieving these design credits? Constructing underground or above-ground parking structures, which is a practice that lends itself to the extensive use of precast concrete materials, can substantially reduce not only the footprint of a project, but also the heat island effect of the completed project. Using high SRI precast concrete for cladding or roofing, or pavers and slabs for hardscapes, can also help. How can you increase the SRI of your precast concrete structures? Using white cement or certain cementitious materials can help.

A recent study measured the SR of 45 concretes in accordance with ASTM C 1549, "Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer." The concrete constituents consist of six portland cements, six fly ashes, three slag cements, four fine aggregates and two coarse aggregates. While all materials were tested, most concrete mixes were made with the darkest (lowest SR) material combinations, that is, those most likely to fail the LEED criteria. Replacement levels of 25% for fly ash and 45% for slag cement were chosen, because they are commonly used substitution levels for cement.

Tests prove concrete's high SR and SRI values

The study shows that all 45 concretes tested have an SR of at least 0.3 and an SRI of at least 29. Therefore, they all meet the LEED criteria for non-roof surfaces and steep-sloped roofs. Two of the concretes containing white or slag cement also meet the criteria for low-sloped roofs.

The solar reflectance of portland cement has more effect on the SR of concrete than any other constituent material. The SR of the supplementary cementitious material (in this study, fly ash and slag cement) has the second greatest effect. Generally, the higher the SR of the cementitious material, the higher the SR of the concrete.

Slag cement concretes generally have the highest SR values. The average effect of replacing 45% of the cement in a mix with slag cement is to increase (lighten) the SR of the concrete by 0.07. The average effect of replacing 25% of the cement in a mix with dark gray fly ash (defined in this study as fly ash with a solar reflectance of 0.28) is to decrease (darken) the SR by 0.02. The average effect of replacing 25% of the cement in a mix with the other fly ashes is to increase (lighten) the SR by 0.03.

Interestingly, the SR of fine aggregate has a very small effect on the SR of concrete, while the SR of coarse aggregate has no effect on the SR of concrete.

Take the precast advantage

Regardless of mix constituents, precast concrete can reduce heat islands and qualify for points in the LEED Green Building Rating System. The study shows that all 45 concretes tested according to ASTM C 1549 have an SR of at least 0.3 and an SRI of at least 29.

In proclaiming the sustainable and environmental attributes of your precast concrete structures, heat island reduction may

not be at the top of your list. However, depending on the type of structure and the location of the project, this attribute combined with precast concrete's energy savings may give you an additional edge over competing materials that could help secure the job. ■

Claude Goguen, P.E., LEED AP, is NPCA's director of Technical Services.

¹Albedo is the fraction of solar energy reflected from surfaces on Earth back into space.

Heat Islands Cause Undesirable Temperature Spikes and Increased Energy Costs

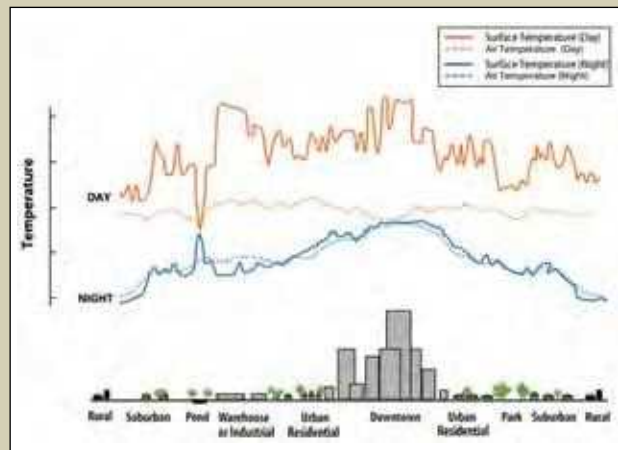


FIGURE 1

Heat islands usually occur in urban areas, so they are sometimes called urban heat islands. Figure 1 shows how heat islands raise the air temperature in urban areas relative to the surrounding countryside. This temperature difference can be as much as 7 F. Urban heat island effects are local and have a negligible influence on climate change, according to the Intergovernmental Panel on Climate Change. However, in places that are already burdened with high temperatures, the heat island effect can make cities warmer, more uncomfortable and occasionally more life-threatening, according to the U.S. Federal Emergency Management Agency. Air temperatures greater than 75 F increase the probability of the formation of ground-level ozone (commonly called smog), which exacerbates respiratory conditions such as asthma. Higher temperatures also lead to a greater reliance on air conditioning, which leads to more energy use.

ASTM International Releases New Tank Testing Standard and Proposes New Fiber-Reinforcement Test Standard

New ASTM standard test method is specific to septic tank sealing effectiveness.

The recent release of an ASTM testing standard creates a new benchmark for quality assurance that could boost the marketability of precast concrete septic tanks.

ASTM International's new ASTM C1719, "Standard Test Method for Installed Precast Concrete Tanks and Accessories by the Negative Air Pressure (Vacuum) Test Prior to Backfill," was developed under ASTM's technical sub-committee C27.30, which falls under the main ASTM Committee for precast products, C27. (For information on how to become involved with ASTM C27, visit www.astm.org/COMMIT/COMMITTEE/C27.htm.)

Prior to the release of the new standard, precast manufacturers, engineers, specifiers and regulators could rely only on a manufacturing reference for testing watertightness of precast concrete septic tanks – ASTM C1227, "Standard Specification for Precast Concrete Septic Tanks." The new C1719 standard contains elements of C1227 for septic tanks and is also similar to the previously developed ASTM C1244, "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill." ASTM C1719 is different from C1244 in that it provides a vacuum test method for installed precast tanks and accessories as an

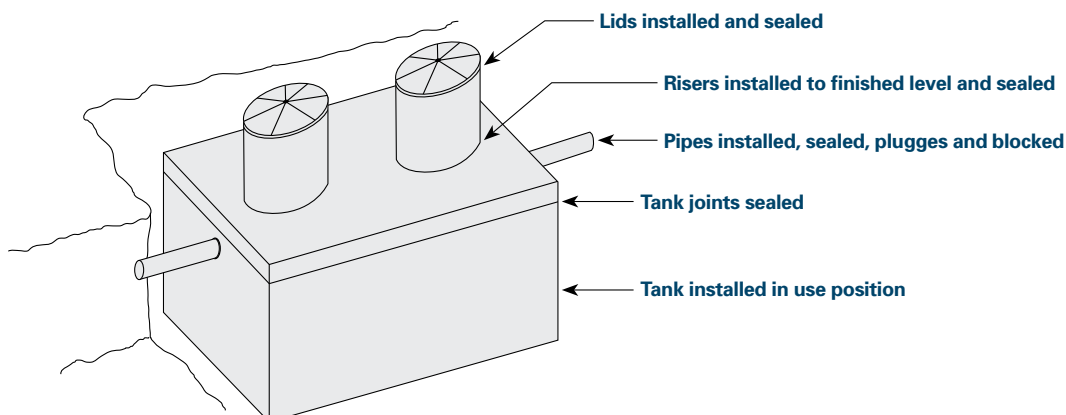
"installed system." The scope of the new C1719 standard covers tanks for onsite wastewater treatment and storage, grease interceptors, grit/oil separators, water storage and other applications requiring watertight construction and installation.

Excellent marketing tool

The new C1719 standard can be used with confidence by manufacturers and installers of precast tanks and systems as an excellent marketing tool for their businesses when asked by an Authority Having Jurisdiction (AHJ) for an ASTM test method of the effectiveness of an installed system. Armed with this nationally recognized and consistent negative air pressure (vacuum) method for testing watertightness of systems prior to backfill also eliminates the need of carting huge quantities of water to your site for a water test. A water test, while serving the purpose for testing a tank, does not completely address the entire installed system (as does the C1719 vacuum test) and is clearly much less sustainable. What do you do with all that water after the test is complete?

Test equipment and method

The equipment required to perform a negative air pressure (vacuum) test is not sophisticated. As stated in section 6 of the C1719 standard, the testing equipment consists of pumps, vehicle vacuum devices and even a high-performance shop-style vacuum cleaner. Most devices are easily operated and the test can be performed in a few minutes using the vacuum method, unlike the hours or even days needed to perform the same test with water.



Like ASTM C1227, C1719 tests apply a vacuum to the sealed system to a level of 4 in. of mercury (Hg) for a duration of five minutes. If the gauge holds without pressure loss, the system passes. If the vacuum level drops, it is reapplied and the test is restarted. A tank or system failing to hold vacuum may be repaired per the manufacturer's

recommendations and/or evaluated for not holding negative pressure and retested following such repair.

Manufacturers and installers of precast tanks should notify and promote to their local AHJ that these standards exist and are the best tools to adopt for the production of precast concrete septic tanks and for watertightness testing of

tanks of all types and installed systems. Those regulating and specifying communities requiring watertightness testing of tanks and systems after installation and prior to backfill can be assured of a precast concrete system's watertight integrity by using the C1719 standard. ■

Fiber-Reinforced Concrete Test Results Covered in Proposed ASTM Standard

A proposed new ASTM standard will provide proper direction and ensure adequate documentation to aid in the interpretation, understanding and reduction of variance in test results for fiber-reinforced concrete.

ASTM WK35250, "Practice for Fiber-Reinforced Concrete for Making and Curing Test Specimens in the Laboratory and Field," is now being developed by Subcommittee C09.42 on Fiber-Reinforced Concrete, part of ASTM Committee C09 on Concrete and Concrete Aggregates.

Fiber-reinforced concrete is not the same as ordinary portland cement concrete in terms of simple fabrication, according to ASTM. There are specific issues that need to be addressed to ensure consistency in making specimens for testing. At this time, there are limited and/or inconsistent practices instructing the industry on how to make FRC specimens.

Current standards for other types of

concrete test samples involve rodding or internal vibration, both methods that can lead to non-uniform fiber concrete. Both of these conditions increase variance between test results.

ASTM WK35250 describes testing done by external vibration, which is effective for fiber-reinforced concrete. Testing agencies and those who specify testing of fiber concrete will use the proposed standard once it has been approved. Fibers can be used in any concrete, and particularly fiber-reinforced concrete is used in precast applications, industrial floor slabs, composite metal decks, blast containment structures, overlays, tunnels and many other applications.

All interested parties are invited to participate in the development of ASTM WK35250. For more news in this sector, visit www.astm.org/sn-construction or follow it on Twitter @ASTMBuildings. ■



An advertisement for QMC Hydraulic Cranes. It features a red hydraulic crane mounted on a truck chassis. The crane has a long, telescopic boom. The background is a metallic diamond plate pattern. The QMC logo is in the top left, and the phone number 800-331-7959 is prominently displayed. Below the crane, it says "Built in U.S.A." with a small American flag icon.

An advertisement for Distinctive Molds. It features the company logo, which consists of the letters "DM" in a stylized font. The text "DISTINCTIVE MOLDS" is to the right of the logo. Below the logo, it says "Formerly Shawnee Molds". The main text of the ad lists various products: "All our molds are 3/16\" thick Virgin ABS Plastic." followed by "Splash blocks, patio stones, wall caps, release agents, birdbaths, vibrating tables, retarder paper, and MORE...". At the bottom, the phone number "1-800-281-8746" and the website "DISTINCTIVEMOLDS.COM" are listed.

NPCA Awards

The annual NPCA awards program recognizes excellence in precasting and includes everything from creative precast projects to the top scores in Plant Certification to stellar safety records based on the OSHA 300 log reports. Awards were presented in conjunction with The Precast Show in Orlando at special events on Feb. 29 and March 1. Here is a summary of this year's award-winning plants.

CREATIVE USE OF PRECAST (CUP AWARDS)

Please visit www.precast.org/awards for more project photographs and additional details.

FIRST PLACE ABOVE GROUND

Precaster: *Anchor Concrete Products, Kingston, Ontario*
Project: *Monorail Test Track for Bombardier Transportation Systems Canada*

Anchor Concrete developed a variety of in-house manufacturing innovations in casting 1.125 miles of precast concrete monorail track for Bombardier Transportation Systems. The project included 124 straight beams with lengths ranging from 22 ft to 38 ft, 19 transition beams 33 ft in length and 20 super-elevated curved beams, also 33 ft in length. To provide an exceptionally smooth ride, all beams were required to have extremely tight tolerances.



ANCHOR CONCRETE PRODUCTS – MONORAIL TEST TRACK FOR BOMBARDIER TRANSPORTATION SYSTEMS



NITTERHOUSE CONCRETE PRODUCTS – MONTCLAIR STATE UNIVERSITY PRECAST/PRESTRESSED PARKING STRUCTURE

SECOND PLACE ABOVE GROUND

Precaster: *Nitterhouse Concrete Products*
Project: *Montclair State University Precast/Prestressed Parking Structure*

To meet the needs of a growing student population, Montclair State University, Montclair, N.J., wanted a parking structure that would replicate the Spanish mission-style architecture prevalent throughout the campus. Nitterhouse Concrete Products developed an innovative bolt-on system for the precast arches used in the project and created a beautiful and highly detailed structure that included 63 columns with a variety of architectural finishes, 68 beams, 600 double tees, 18 solid slabs, six precast panels and 169 precast/prestressed panels with architectural finishes, along with 99 horizontal light walls.

THIRD PLACE ABOVE GROUND

Precaster: *Universal Precast*
Project: *Fort Rosecrans National Cemetery, POW Sculpture Base*

Commissioned by a group of former POWs who wanted a lasting symbol to commemorate the sacrifice of American prisoners of



UNIVERSAL PRECAST – FORT ROSECRANS NATIONAL CEMETERY, POW SCULPTURE BASE

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war, Universal Precast fabricated a custom decorative precast concrete base for a bronze sculpture placed near the entrance of Rosecrans National Cemetery in San Diego. The elegant design includes fluted vertical sides, cast-in letters that spell "LIBERATION" and five round recesses that hold bronze seals for each of the five military branches. By using precast rather than the traditional granite or marble, the precaster saved the POW group \$10,000 to \$20,000 and months of production time.

FIRST PLACE UNDERGROUND

Precaster: *U.S. Concrete Precast Group-Southern California*

Project: *Magnetometer Stabilization Caissons*

When the military needed to stabilize sensitive equipment 60 ft deep on the floor of the Pacific Ocean, it was precast concrete that delivered the best solution to a touchy problem. U.S. Concrete Precast Group-Southern California created a stabilization system of precast concrete piles and caissons to meet the extremely tight parameters for the project, including tidal action, the extremely sensitive nature of the equipment and a short timeline. The massive structures were transported at night under escort by the California Highway Patrol and were set in place with a 700-ton barge crane. By using precast concrete in place of other materials, the military saved an estimated \$1.7 million, according to the precaster.



U.S. CONCRETE PRECAST GROUP - SOUTHERN CALIFORNIA – MAGNETOMETER STABILIZATION CAISSONS

SECOND PLACE UNDERGROUND

Precaster: *Norwalk Concrete Industries*

Project: *Stormwater Recycling Sluiceway for Pedestrian Promenade*

There are few annual events that draw the level of attention garnered by a Super Bowl. To prepare for the influx of visitors expected in downtown Indianapolis for Super Bowl XLVI, the city completely renovated a three-block stretch of Georgia Street that would serve as Super Bowl Village during the days leading up to the big game. Underneath this newly constructed



NORWALK CONCRETE INDUSTRIES – STORMWATER RECYCLING SLUICEWAY FOR PEDESTRIAN PROMENADE

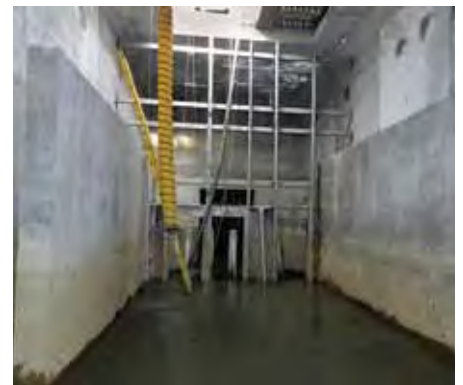
pedestrian promenade sits an innovative precast concrete water-recycling stormwater sluiceway, but it wasn't originally planned that way. Norwalk Concrete Industries, initially contracted to provide only load-bearing grade beams, looked at the initial design and convinced the contractor that a series of custom precast structures would provide many benefits over the originally specified cast-in-place system. Norwalk provided more than 700 precast components, including modified box culvert, drainage sluice foundations, foundation grade beams, support pedestals and three custom electrical vaults. With the project located in the heart of a busy downtown and with a looming Super Bowl deadline, the precast option enabled the contractors to work within a small footprint, save labor costs and speed up construction time.

THIRD PLACE UNDERGROUND

Precaster: *Garden State Precast Inc.*

Project: *Bronx River Combined Sewer Overflow*

Management of wastewater is a vital part of our society, and often precast is called upon to shoulder the load. The Bronx River CSO project provides a perfect example of why precast is the ideal material for managing a municipality's wastewater needs. Garden State Precast created the precast structures for 23 sections that form a three-chamber post-tensioned unit for the removal of solids from combined sewer outfall. The use of



GARDEN STATE PRECAST INC. – BRONX RIVER COMBINED SEWER OVERFLOW

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precast concrete reduced on-site labor costs over cast-in-place. The pieces were delivered as-needed by the contractor, often on rainy days to fill holes in the contractor's schedule. The smaller footprint provided by precast construction was also important to the city, because the project is located adjacent to a school and traffic diversions needed to be kept to a minimum.

CUP AWARD HONORABLE MENTIONS

Precaster: *Arto Brick California Pavers, Gardena, Calif*

Project: *Mariachi Plaza*

Precaster: *Nitterhouse Concrete Products Inc., Chambersburg, Pa.*

Project: *Riddle Memorial Hospital West Parking Garage and Pedestrian Bridge*

Precaster: *Smith-Midland Corp., Midland, Va.*

Project: *Camp Lejeune Mock Afghan Village*

Precaster: *Speed Fab-Crete, Fort Worth, Texas*

Project: *Woodall Rodgers Deck Park*

Precaster: *Gillespie Precast, Chestertown, Md.*

Project: *Camp Pecometh Centralized Wastewater Treatment System*

THE PINNACLE AWARD

The Pinnacle Award competition, sponsored by Spillman Co., takes place during The Precast Show each year. This is a competition to find the most innovative labor-saving device, safety enhancement or management program among NPCA member plants. Those who enter the competition make a short presentation that is judged by their peers, with one representative from each plant in attendance serving as a judge. The results of this year's Pinnacle presentation will be published in the next edition of *Precast Inc.*

NPCA PLANT CERTIFICATION TOP 25 PLANTS

Quality has never been more important, and NPCA annually recognizes its member plants for quality production practices through its Top 25 awards program. To qualify, a plant must post one of the top 25 scores in its annual plant certification inspection. With more than 370 plants in its certification program, a score in the top 25 places a plant among the top 7% of all certified plants. Here's the list of NPCA's Top 25 plants in 2011:

A.C. Miller Concrete Products Inc., Blairsville, Pa.

Armtec/Durisol, Mitchell, Ontario

Blalock Ready Mix, Sevierville, Tenn.

By-Crete, Lebanon, Pa.

C.R. Barger & Sons Inc., Lenoir City, Tenn.

Champion Materials Inc., Carthage, N.Y.

Colorado Precast Concrete Inc., Loveland, Colo.

Concrete Building Supply, Plattsburgh, N.Y.

County Materials Corp., Roberts, Wis.

Dellinger Precast Inc., Denver, N.C.

Diamond Concrete Products LLC, Guyton, Ga.

Firebaugh Precast Inc., Dacono, Colo.

Firebaugh Precast Inc., Colorado Springs, Colo.

The Fort Miller Co. Inc., Greenwich, N.Y.

Gerber Construction Inc., Lehi, Utah

H2 Pre-Cast Inc., East Wenatchee, Wash.

Mack Vault of Toledo, Bowling Green, Ohio

Oldcastle Precast Inc., Telford, Pa.

Oldcastle Precast Inc., Nampa, Idaho

Phoenix Precast Products, Concord, N.H.

Shea Concrete Products Inc. - Amesbury, Amesbury, Mass.

Southern Precast Inc., Alachua, Fla.

Terre Hill Concrete Products Inc., Lebanon, Pa.

Terre Hill Concrete Products Inc., Terre Hill, Pa.

Universal Precast, Theodore, Ala.

Zeiser Wilbert Vault Inc., Elmira, N.Y.

QUALITY AWARD OF EXCELLENCE

The top three plant certification scores from among the Top 25 list receive a special award from NPCA, the Quality Award of Excellence. The recipients of this award represent the top 1% of the NPCA Plant Certification program. The winners are:

Firebaugh Precast Inc., Dacono, Colo.

The Fort Miller Co. Inc., Greenwich, N.Y.

Mack Vault of Toledo, Bowling Green, Ohio

PLANT CERTIFICATION ANNIVERSARY AWARDS

This award honors plants that have been continuously certified for milestones of 5, 10, 15 and 20 years. This year's honorees are:

20 YEAR AWARDS

Advance Concrete Products Co., Highland, Mich.

Faddis Concrete Products, Downingtown, Pa.

15 YEAR AWARDS

American Concrete Products Co., Omaha, Neb.

Oldcastle Precast Inc., Littleton, Colo.

Permatile Concrete Products Co., Bristol, Va.

10 YEAR AWARDS

Baxter Precast LLC, Fairfield, Ohio

C.J. Pink Ltd., Dorchester, Ontario

Coastal Pipeline Products Corp., Calverton, N.Y.

Concrete Concepts Inc., McKees Rocks, Pa.

E.C. Babbert Inc. Canal Winchester Plant, Canal Winchester, Ohio

Faddis Concrete Products, New Castle, Pa.
Granite Precasting & Concrete Inc., Bellingham, Wash.
Hanson Pipe & Precast, Columbus, Ohio
Hanson Pipe & Precast, Sidney, Ohio
Independent Concrete Pipe Co. - Ohio Division, Sylvania, Ohio
Jensen Precast, North Las Vegas, Nev.
LHV Precast Inc., Kingston, N.Y.
Rinker Materials - Concrete Pipe Division, Westfield, Mass.
Trenwa Inc., Florence, Ind.
United Precast Industries LLC, Mount Vernon, Ohio
Western Precast Concrete Inc., El Paso, Texas
Zeiser Wilbert Vault Inc., Elmira, N.Y.

5 YEAR AWARDS

Advanced Drainage Structures, Greencastle, Pa.
Altomare Precast Inc., Philadelphia, Pa.
Americast Inc., Martinsburg, W.V.
Back River Pre-Cast LLC, Reisterstown, Md.
Bethlehem Precast Inc., Bethlehem, Pa.
Carr Concrete Corp., Williamstown, West Va.
CGM Precast Concrete Inc., Indianapolis, Ind.
Champion Precast Inc., Troy, Mo.
Cherry Precast, Rural Hall, N.C.
Continental Concrete Products Inc., Pottstown, Pa.
Contractors Precast Corp., Davidsonville, Md.
Co-Pipe Products Inc., Taylor, Mich.
County Materials Corp., Charleston, Ill.
County Materials Corp., Roberts, Wis.
DiCicco Concrete Products Inc., Chicago Heights, Ill.
Dyer Vault Co. Inc., Dyer, Ind.
Eastern Vault Co. Inc., Princeton, W.V.
F & W Construction Co. Inc., Ozark, Ala.
Faddis Concrete Products - Roaring Spring Plant, Roaring Spring, Pa.
Five Diamond Precast, Salt Lake City, Utah
Gillespie Precast LLC, Chestertown, Md. (Dixon Dr.)
Gillespie Precast LLC, Chestertown, Md. (Brickyard Rd.)
H2 Pre-Cast Inc., East Wenatchee, Wash.
Hanson Pipe & Precast, Mobile, Ala.
Hanson Pipe & Precast, Jessup, Md.
Hanson Pipe & Precast, Jackson, Miss.
Hanson Pipe & Precast, Wakefield, R.I.
Hanson Pipe & Precast, Richmond, Va.
Harper Contracting Inc., Salt Lake City, Utah
Horn Precast, Columbus, Ind.
Interstate Safety Service Inc., Clarks Summit, Pa.
J.E. Hill Precast, Leesburg, Fla.
K.J. Williams Concrete Co. Inc., Cresaptown, Md.
Lee's Precast Concrete Inc., Aberdeen, Miss.
McCarroll Precast, Lehman, Pa.
Midwest Tile & Concrete Products Inc., Woodburn, Ind.
Modern Precast Concrete, Easton, Pa.
Modular Connections LLC, Bessemer, Ala.
Monarch Products Co. Inc., York Haven, Pa.
Oldcastle Precast Inc., Fuquay Varina, N.C.
Oldcastle Precast Inc., Houston, Texas



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Oldcastle Precast Inc. - Brookshire Facility, Brookshire, Texas
Olson Precast Co., Las Vegas, Nev.
Pro-Cast Products Inc., Highland, Calif.
S & S Precast Inc., Winamac, Ind.
Scituate Concrete Pipe Corp., Scituate, Mass.
The Fort Miller Co. Inc., Greenwich, N.Y.
U.S. Concrete Precast Group - Phoenix, Phoenix, Ariz.
Vaughn Concrete Products Inc., Cheyenne, Wyo.
Wine Concrete Products Inc., Sewickley, Pa.

SAFETY

Based on data from the OSHA 300 log, the NPCA Safety Awards program honors those companies with outstanding safety records in three categories based on the number of man-hours of production. The Platinum Award, the highest level of safety achievement, is presented to members with zero OSHA reportable/recordable injuries during the recording period. All remaining entries not qualifying for Platinum awards are eligible for awards in the additional category. Plants with the best reportable injury/illness rate earn the Gold Award; second best earns Silver; third best earns Bronze. The plant in each category that has recorded the most improvement from its previous year's rate earns the Most Improved award. Here are the 2011 winners:

CATEGORY I (0-60,000 HOURS)

Platinum Award

C.J. Pink Ltd., London, Ontario
Carr Precast Concrete Inc., Dunn, N.C.
Goldens Bridge Unit Step Co. Inc., Carmel, N.Y.
Hanson Pipe & Precast, Mobile, Ala.
Hanson Pipe & Precast, Montgomery, Ala.
Hanson Pipe & Precast, Tacoma, Wash.
Hanson Pipe & Precast, Birmingham, Ala.
Hanson Pipe & Precast, Wauregan, Conn.
Hanson Pipe & Precast, LaPlace, La.
Husted Concrete Products Inc., New York Mills, N.Y.
Oldcastle Precast Inc., San Antonio, Texas
Spoerr Precast Concrete Inc., Sandusky, Ohio
Trenwa Inc., Florence, Ind.
Wieser Concrete Products Inc., Roxana, Ill.
Wieser Concrete Products Inc., Fond du Lac, Wis.

Gold Award

Hanson Pipe & Precast, Como, Miss.

Silver Award

StructureCast, Bakersfield, Calif.

Bronze Award

Hanson Pipe & Precast, Jackson, Miss.

Most Improved Award

Hanson Pipe & Precast, Como, Miss.

CATEGORY II (60,001-120,000 HOURS)

Platinum Award

Arrow Concrete Products Inc., Granby, Conn.
Champion Precast Inc., Troy, Mo.
Hanson Pipe & Precast, Pelham, Ala.
Hanson Pipe & Precast, Richmond, Va.
Hanson Pipe & Precast, Green Cove Springs, Fla.
Jersey Village, Houston, Texas
Monarch Precast Concrete Corp., Allentown, Pa.
Oldcastle Precast Inc., Middle Island, N.Y.
Oldcastle Precast Inc., Wilsonville, Ore.
Oldcastle Precast Inc., Brookshire, Texas
Scituate Precast, Marshfield, Mass.
U.S. Concrete Precast Group-Phoenix, Phoenix, Ariz.
Wieser Concrete Products Inc., Maiden Rock, Wis.

Gold Award

San Antonio Pipe, San Antonio, Texas

Silver Award

Jensen Precast Las Vegas, North Las Vegas, Nev.

Bronze Award

Hanson Pipe & Precast, Hattiesburg, Miss.
Oldcastle Precast Inc., Topeka, Kan.

Most Improved Award

U.S. Concrete Precast Group, Phoenix, Ariz.

CATEGORY III (120,001+ HOURS)

Platinum Award

Colorado Precast Concrete Inc., Loveland, Colo.
Houston Precast, Houston, Texas

Gold Award

Harper Contracting Inc., Salt Lake City, Utah

Silver Award

Americast-Ashland Structures Plant, Ashland, Va.

Bronze Award

U.S. Concrete Precast Group, San Diego, Calif.

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People & Products is a forum where NPCA members and nonprofit organizations can share information on new products, personnel promotions/acquisitions or service announcements concerning the precast concrete industry. Items are printed on a space-available basis. For possible inclusion, send your press releases and photos to NPCA. Attn: Precast Inc. magazine, 1320 City Center Drive Suite #200, Carmel, IN 46032 or email them to rhyink@precast.org.

Hamilton Kent names national account manager

Hamilton Kent LLC, based in Lexington, Ky., has promoted Roman Selig to national sales manager for concrete products. Since joining Hamilton Kent in January 2010, Selig has played an integral role in promoting the company's products to specifiers and engineers in the southeast region of the United States. In addition, as a result of Roman's many years of experience in the precast concrete industry, he has often provided design assistance and advice to producers of concrete product.

Selig will serve customers in Alabama, Florida, Georgia, Mississippi, North Carolina and South Carolina, and will also be available to precast concrete producers nationally. He will assist existing and potential new accounts across the United States and Canada by providing technical advice on concrete pipe, manhole and box culvert products.

Selig has 24 years of experience in the concrete pipe and precast concrete industry after getting his start with Sherman Industries and later with Hanson Pipe & Precast. Based in Birmingham, Ala., he is a civil engineer and remains active with a number



ROMAN SELIG

of industry organizations including the American Society for Testing and Materials (ASTM), where his work was recently recognized with the ASTM

International Award of Merit, the most prestigious award offered to an individual member.

For more information about Hamilton Kent, visit www.hamiltonkent.com.

Spancrete announces new head of human resources

Spancrete, a leader in the precast/prestressed concrete industry based in Waukesha, Wis., has promoted Scott Bertschinger to vice president of human



SCOTT BERTSCHINGER

resources and risk management.

A Spancrete employee since 1997, Bertschinger most recently served as the company's corporate director of human

resources and risk management. His promotion comes on the heels of the retirement of the former head of human resources, Bill Wagner.

Bertschinger has a bachelor's degree in urban and regional planning from the University of Wisconsin-Green Bay. His responsibilities include all human resources, safety, insurance and risk management activities, as well as the environmental oversight of all manufacturing and construction activities.

For more information about Spancrete, visit www.spancrete.com.

Columbia and Haarup announce strategic partnership

To better support their increasing base of customers and the changing needs of companies in the precast, pipe, masonry, paver and hardscapes markets, Columbia Machine Inc. and Haarup Maskinfabrik A/S will be investing additional resources in the North American market.

Haarup will establish a new satellite operation to expand its presence in North America, enhancing the strong support Columbia and Turmac have provided for many years. The location

of this new operation will be announced at a later date. New positions will be added in the areas of sales and service. Haarup will focus on the precast and pipe markets.

Columbia's Batching Division will focus on the masonry, paver and hardscape markets. In addition to investments in sales, service and engineering to support these markets, Columbia will introduce a number of new solutions focused on color blending, rapid plant changeover, faster batch cycle times and enhanced product quality.

Columbia and Haarup plan to increase inventory levels to support their large base of production plants. Both companies have stated that spare parts availability is a key part of the high level of customer service they provide 24 hours a day, seven days a week.

For more information, visit www.columbiemachine.com, or call Tim Goode of Columbia Machine Inc. at (360) 694-1501 ext. 553, or email him at timgoo@colmac.com.

Bilco releases new powder coat finish

The Bilco Co., based in New Haven, Conn., has announced that its Classic Series steel basement doors will now be offered with a factory-applied powder coat finish. Initially available on the company's most popular sizes, Size



BILCO'S POWDER-COATED BASEMENT DOOR

B and C steel-sided doors, this option offers a superior finish to conventional paint while eliminating the time and expense required by the customer to finish a door upon installation. Powder coated basement doors will be offered in four standard colors (white, sandstone, light gray and brick) to complement the exterior of any home.

Powder coating makes metal products durable, attractive, extremely scratch-resistant and is ideal for exterior applications. The powder coating process is environmentally friendly and virtually pollution-free.

For more information on Bilco's complete line of access products, visit www.bilco.com.

Hyster to acquire dealer network

Hyster Co., an operating division of NACCO Materials Handling Group Inc. based in Greenville, N.C., has announced that letters of interest to acquire Barloworld US operations have been executed with two parties. NACCO has approved both parties as being able to provide first-class representation for the Hyster brand.

Some time ago, Barloworld advised of its intent to exit the materials handling business in the United States. Over the past several months, Hyster helped Barloworld negotiate the sale.

The two parties are Briggs Equipment Inc., a current Yale dealer that will now represent Hyster Co. in Florida, Arkansas and portions of North Carolina, South Carolina, Georgia, Alabama, Tennessee and Mississippi; and LiftOne, which will represent Hyster in portions of North Carolina, South Carolina, Georgia, Alabama, Virginia and Tennessee.

The transactions are expected to close by March 31. For more information about Hyster, visit www.hyster.com.

Dayton Superior introduces the C-68 Century Series hangers

Dayton Superior, based in Dayton, Ohio, has introduced the C-68 Century Series hangers. The C-68 Century Series hangers are half hangers for supporting overhang formwork when stay-in-place metal decking is used on the interior



DAYTON SUPERIOR'S C-68 CENTURY SERIES HANGERS

bays in bridge deck construction.

Each type of C-68 hanger within the series meets the design and higher load capacity criteria required in the construction of larger bridge decks. Each hanger is a laser-cut, one-piece design and is available in hot-dipped galvanized or plain finishes from 7,000 to 12,000 pounds of Safe Working Load (SWL). No special installation equipment is required for the hangers, says the company.

For more information about Dayton Superior's products for highway and bridge construction, visit www.daytonsuperior.com/highwaysandbridges.

Redi-Rock announces 2011 Rocky Awards winners

Redi-Rock International, a leading large-block retaining wall system licensor based in San Antonio, has announced the winners of its annual Rocky Awards for projects completed in 2011.

Piedmont Precast, an NPCA member based in Atlanta, was awarded the People's Choice Rocky Award for a stunning residential project in Tuscaloosa, Ala. Leveling the hilly lot for a 21,000-sq-ft home required extensive retaining walls, and Redi-Rock Cobblestone walls were a perfect fit for the job. A 30-ft-tall reinforced wall supported the home, and a 12-ft-tall gravity wall supported the driveway. But the crown jewel of the project was a spiral staircase constructed using Redi-Rock blocks; the inside barrel of the staircase stood 18 ft tall, and the outside barrel stood 30 ft tall.

ABC Precast of Nanaimo, British Columbia, also an NPCA member, received Residential Wall of the Year for the reinforced sea walls at a Vancouver



PIEDMONT PRECAST'S PROJECT WON PEOPLE'S CHOICE IN REDI-ROCK'S ROCKY AWARD

Island, British Columbia, home.

The Rocky Awards honor the best Redi-Rock walls built in the categories of Commercial Wall of the Year, Water Application Wall of the Year, Residential Wall of the Year, and the new People's Choice Award chosen by the general public in an online vote. More than 130 Redi-Rock manufacturers across North America and Europe competed for the awards.

For more information, visit www.redi-rock.com.

NPCA staff member elected as ASTM C27 officer



EVAN GURLEY

Evan Gurley, a technical services engineer with NPCA, was elected as membership secretary to the ASTM C27 committee on precast concrete products. His

term of service is Jan. 1 to Dec. 31, 2012.

Also elected were Howard Wingert, president of Concrete Sealants Inc., as chairman, and Hugh Martin, a senior product design engineer with Hanson Pipe & Precast, as vice chairman. Both companies are NPCA members.

For more information about ASTM International, visit www.astm.org. ■

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NPCA CALENDAR

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

Meeting	Location	Date
NPCA 47th Annual Convention	Ritz-Carlton – New Orleans	Oct. 3-6, 2012
The Precast Show 2013	Indiana Convention Center – Indianapolis	Jan. 11-13, 2013
The Precast Show 2014	George R. Brown Convention Center – Houston	Feb. 13-15, 2014
The Precast Show 2015	Orange County Convention Center - Orlando, Fla.	Feb. 5-7, 2015

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