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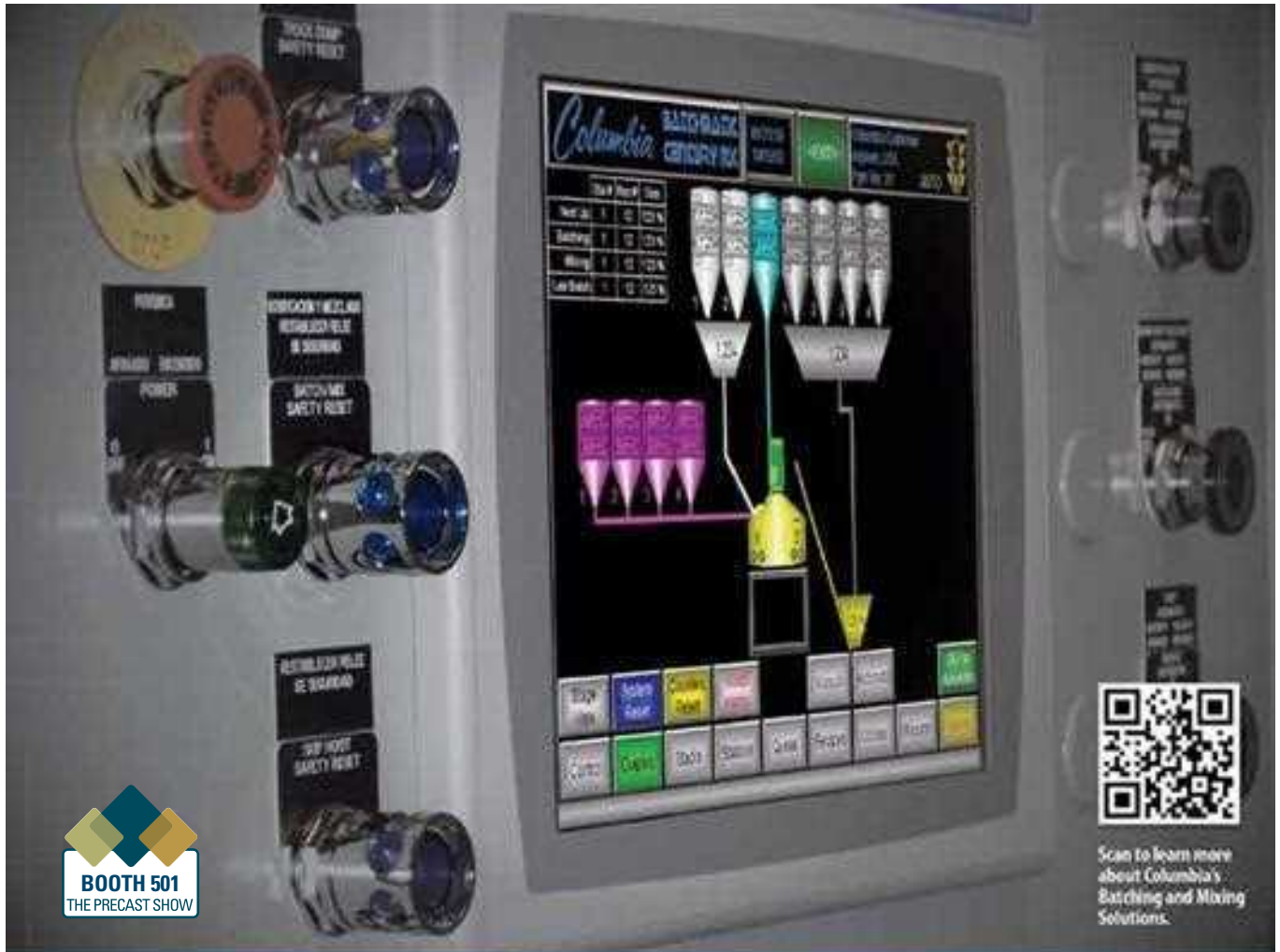
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Educate and Advocate

BY MIMI RAINERO COLES | *Chairman, National Precast Concrete Association*

Things are beginning to calm down from the highly contentious 2012 elections. Campaign ads no longer monopolize radio and television, candidate signs are disappearing from yards and billboards, our interests have turned to football, hockey and the upcoming holidays! The media and political pundits will quickly turn their attention to the successful candidates and speculation will abound over what they'll do and how quickly they can accomplish what was promised during their campaigns. It will take a few months for the new Congress to really take shape and begin working (together, hopefully) on the many important issues that are of immediate concern to our country.

In his keynote luncheon address at our 47th Annual Convention, political strategist Charlie Cook gave us some insight into the 2012 elections. He commented on polling results, the debate process and his perspective on the presidential and senate races in close states. He encouraged owners and plant managers to take the opportunity to be advocates for ourselves and our industry, and reach out to representatives – new or incumbent – and invite them to visit our production facilities. He encouraged us to educate and advocate for the precast concrete products industry!

As business owners and managers, we're sizing up what impact the elections will have on the current and future operation of our businesses. For some of us, there will be new faces representing our local, state and national interests and possible changes to existing laws and policies. Now is the perfect time to make contact with our representatives and build or strengthen relationships that may be important to our businesses down the road.

The newly elected are hiring staff, organizing headquarters and digging in to pressing issues. Incumbents will be thanking their constituents and getting back to the business at hand. Before they're too tied up with the day-to-day legislative sessions, there's an opportunity to contact them and invite them to your plant. Nearly every elected official wants to be seen as a friend of manufacturing, and there are very few industries as locally based as precast concrete producers. We make our products locally, put them in the ground and erect them locally while employing a home-grown workforce.

If you can get your representative to commit to a visit, you've just crossed a major hurdle. Once they're in the door, show them around the plant. Tell them about your employees.

Introduce them to your management team. Educate them about your role in building local infrastructure and how precast concrete plays a vital role in the construction industry. Share stories about special community projects, contributions or services to stress your local ties. Talk about your use of resources in the community and the economic impact your plant has on the community.

Not used to reaching out? Here are a few tips on how to do it.

- Call your elected official and find out if there is a staff person who oversees infrastructure or construction issues and get to know that person. Now is the time when you can make valuable contacts among new staff who are just getting to know their territories. If your elected official is an incumbent, the recent election is a great excuse to call with congratulations and an invitation to visit your plant.
- Write and introduce yourself, making the point that you are an employer and taxpayer in their jurisdiction, and you would be interested in meeting with them and showing them your plant.
- Meet with them in their offices or attend a town hall meeting if you cannot set up a plant visit. Be persistent. Have two or three key points to make, and be very concise and positive.
- After you have had an initial contact with your elected official or staff person, make sure to follow up with a handwritten thank you.

Whatever you do, do something! If you educate your elected leaders and advocate for your business and promote precast concrete as a dynamic, efficient, modern construction material, you can't lose. The gains you make may not be immediate, but you'll be staking your claim as an important voice in your community and in our industry. Whether your representative is an incumbent or new to the office, now is an excellent time to reach out to "educate and advocate" for the precast concrete products industry. After all, we're the ones that know it best! ■

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Issue!

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COVER STORY

Huffcutt Concrete Inc.

John Olson, Steve Olson and Bill Olson are the faces at Huffcutt Concrete Inc., Chippewa Falls, Wis., that represent all their employees, their customers, their suppliers and even their competitors. Each relationship is a part of the whole that adds up to the company's well-being and success. In the background is Dorais Field, a precast concrete concession stand and restroom building Huffcutt Concrete manufactured for a local high school's athletic program.

Story and photo by Ron Hyink

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New ASTM Blended Cement Types

Refresh your knowledge of current cements used in the industry and learn about the new ASTM blended cement types, how they are specified, and updated permissible percentages for slag, limestone and pozzolans.

BY TERRY HARRIS

Cement is our bread and butter. We know everything about the cement we use in our precast production plants and how hydration occurs. We can easily recite all the current cement types. But are you aware of the new blended cement types and allowable component percentages from ASTM? In this article you will find a short “Cement 101” refresher as well as what you need to know about ASTM’s significant changes for blended cements.

Cement 101 – a quick refresher

Cement, as defined by the American Concrete Institute (ACI), is “Hydraulic cement – a binding material that sets and hardens

by chemical reaction with water and is capable of doing so underwater.” It further defines portland cement as “a hydraulic cement produced by pulverizing clinker formed by heating a mixture, usually of limestone and clay, to 1400 to 1600 C (2550 to 2900 F). Calcium sulfate is usually ground with the clinker to control set.” In the United States, precast concrete producers use cement that falls under these definitions, and most of these cements will conform to ASTM C150.¹

Cement is the binding material that we use to produce concrete. The chemical reaction, called hydration, starts when water comes into contact with the cement. The reaction takes place at the surface of the cement particle where a fibrous

growth takes place that connects the individual cement grains and also binds the aggregate at the same time. Most of this process takes place in the first 30 days, but it will continue as long as unreacted cement and water are available and there is space for the hydration product.

ASTM has three standards that address cement and cement types. ASTM C150 is the most common cement used and is familiar to most of us in the precast industry. The 10 current cement types listed in ASTM C150 are:

1. **Type I** – For use when the special properties specified for any other type are not required
2. **Type IA** – Air-entraining cement for the same uses as Type I, where air entrainment is desired
3. **Type II** – For general use, more especially when moderate sulfate resistance is desired
4. **Type IIA** – Air-entraining cement for the same uses as Type II, where air entrainment is desired
5. **Type II(MH)** – For general use, more especially when moderate heat of hydration is desired
6. **Type II(MH)A** – Air-entraining cement for the same uses as Type II(MH), where air-entrainment is desired
7. **Type III** – For use when high early strength is desired
8. **Type IIIA** – Air-entraining cement for the same use as Type III, where air entrainment is desired
9. **Type IV** – For use when a low heat of hydration is desired
10. **Type V** – For use when high sulfate resistance is desired

Some cements are noted with dual designations such as Types I/II or II/V, indicating that the cement will meet either type.

In most areas of the United States, Types I, II and III are the most commonly used. Certain areas, particularly for sulfur-rich California soils, may require Type V cement. With the general availability of

air-entraining admixtures that can fine-tune air content, air-entraining cements are seldom, if ever, used today, and Type IV for mass concrete pours is rarely used. In instances where a Type IV cement may be required, fly ash and/or slag will be used in the mix with a Type I or II cement. These classifications are based solely on standard chemical and physical properties unless optional requirements are specified. There are no performance tests required to differentiate the durability properties of each cement type. For example, there are no tests required to show that Type V cement is, in fact, highly sulfate-resistant.

Readily available in North America, white portland cement is often used in architectural precast for its white color and to facilitate use of integral colors. Basically, white cement has the same properties as gray cement, except for color. Color depends on the raw materials used and the manufacturing process. Metal oxides (primarily iron and manganese) influence the color of the cement. White cement is manufactured to conform to ASTM C150 and CSA specifications. While Types I, II, III and V white cements are available, Types I and III are the most often used.

New ASTM blended cement designations

Blended cements governed by ASTM C595² pertain to four classes for both general use and special applications. Significant changes have recently been approved for this new 2012 specification. These changes will permit the interblending of naturally occurring limestone – both independently and in conjunction with pozzolan or slag, up to a maximum of 15%. There will now be four major classifications:

1. **Type IS** – Portland blast-furnace slag cement – up to 95% slag permitted
2. **Type IP** – Portland-pozzolan cement – up to 40% pozzolan permitted
3. **Type IL** – Portland-limestone cement – up to 15% limestone permitted
4. **Type IT** – Ternary blended cement³ – up to 70% of pozzolan + limestone +

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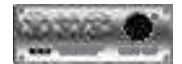
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slag, with pozzolan being no more than 40% and limestone no more than 15%

How to name the new cement blends

There is an additional ASTM requirement to identify the type and amount of each component blended with the clinker. Thus, Type IP(15) designates a cement with 15% pozzolan and Type IS(25) is a cement with 25% slag. With the ternary blended cements, this requirement includes the addition of a letter designation for the component. Accordingly, a Type IT(S20)(P10) would be a cement with 20% slag and 10% pozzolan, with the larger percentage listed first. Where a component like pozzolan, for example, comes from two different sources, it would be identified as: Type IT(20P)(15P) and contain 20% from one pozzolan source and 15% of the other.

If air entrainment is desired, the letter A is added, so type IP(20)A would be a portland-pozzolan air-entrained cement. The letters MS will be added for moderately sulfate-resistant and MH for moderate heat of hydration. The letters HS designate highly sulfate-resistant cement, and LH stands for low heat of hydration. Thus, Type IT(S25)(P10)(MH)A is an air-entraining cement with a moderate heat of hydration containing 25% slag and 10% pozzolan. While these new designations can be quite lengthy, they are very descriptive and, as such, advantageous to

the user. Somewhat simplified designations are permitted and will be encountered as described in ASTM C595. At the present time, limestone in excess of 5% is not permitted in MS and HS designations, pending results of further research.

As with the ASTM C150 cements, the blended cements are required to meet standard chemical and physical requirements. There are also chemical and physical requirements for the pozzolans, limestone and slag used to manufacture the blended cements. Blended cements are currently used in a small percentage of concrete, but this may change significantly in the future with the increase in green construction requirements.

ASTM performance specification

ASTM C1157⁴, along with Canadian Standards Association's CSA A3001⁵, govern the following six classes of cement:

1. **Type GU** – Hydraulic cement for general construction, used when one or more of the special types are not required
2. **Type HE** – High early strength
3. **Type MS** – Moderate sulfate resistance
4. **Type HS** – High sulfate resistance
5. **Type MH** – Moderate heat of hydration
6. **Type LH** – Low heat of hydration



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There is an additional option R for low-reactivity cements when used with alkali-reactive aggregates. ASTM C1157 cements have standard physical requirements but no standard chemical requirements. These cements are tested to verify that they meet the requirements for each type.


Source of material makes a big difference

For the precast concrete producer, the three main concerns with the finished product are required compressive strength, durability and appearance. Of these three, compressive strength is by far the easiest to measure and control. A subset of compressive strength is stripping strength, or the minimum compressive strength required to remove the concrete from the form. While cements will be of a certain ASTM type, actual concrete performance can vary greatly depending on the source of cement used. Some sources may provide very good stripping strength while the final compressive strength may not be as good as cements with a lower stripping strength. For such cases, the details of stripping time, temperature and preset time (for accelerated curing) must be well understood in order to make an informed decision about cement selection.

Again, depending on the source, if a supplementary cementitious material is added to the mix, the reaction with the cement can vary, and the greatest variation may be found in

early strength development for stripping strength.

Without going through a detailed list of variables that can change relative to the cement source or type, it is safe to say that it is always a good practice to run trial tests to verify that you will obtain the performance you are expecting. Even within the same type, different cement sources do not perform exactly the same, but this does not mean that one cement is better than another. For example, if a particular cement results in lower stripping strength, this does not mean that the cement is "bad," but simply that it is not ideal for your specific application.

Additional sources of information about cement are ACI 225R-99, "Guide to the Selection and Use of Hydraulic Cements," and PCA's "Design and Control of Concrete Mixtures." 

Terry Harris is manager of Technical Services, North America with Grace Construction Products, Cambridge, Mass.

¹ Standard Specification for Portland Cement

² Standard Specification for Blended Hydraulic Cements

³ "Ternary" means comprised of three parts. Ternary blended cements are multi-component cements made by blending portland cement (clinker + gypsum) with two complementary cementitious materials such as fly ash, slag, silica fume or pozzolans.

⁴ Standard Performance Specification for Hydraulic Cement

⁵ Cementitious Materials for Use in Concrete (MHb-LHb Blended Hydraulic Cement)



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5 Cost-Saving Tips

Precasters can realize greater profitability with a few simple steps.

BY EVAN GURLEY

The best way to save money, as they say, is to not spend it in the first place, and precasters can take many steps in their day-to-day operations to help keep their money in their pockets.

The most efficient precast plants produce more concrete with less wasted material, less downtime, lower repair costs and fewer disruptions in employee productivity. However, there may be times when plant personnel feel pressure to skip steps in production, finishing or storage that can cause problems down the road or even cause major issues that incur costs far exceeding initial corrective action. The ideas mentioned here may help increase your plant's efficiency and in turn save some costs.

Not all plants are alike, of course, so some of these steps may not make sense for a particular plant and may actually take more time and effort than they are worth. But precasters should always be looking for ways to improve their processes to enhance the efficiency, quality and economy of their operations. So let's take a look at some possible cost cutters.

Preventive maintenance (PM)

When precast plants have some type of formalized inspection and maintenance schedule in place for machines and equipment, the chance for breakdowns and lost production time decreases. By recognizing the importance of regular and consistent

preventive maintenance and continually communicating this to employees, the chances of detecting worn belts, inaccurate scale readings, worn lifting devices/apparatuses, noisy bearings and clogged filters before they break down greatly improve.

Keeping replacement parts in stock for your batch plant, such as boots, water parts, bin signals, dust cartridges, solenoid valves, air cylinders, bearings and various repair kits can help minimize down time in case something breaks. This is especially true for parts that are hard to find or take weeks to be shipped. If you aren't sure which spare parts to have on hand at your plant facility, consult your batch plant supplier to determine the best plan for your plant.

If you do stock parts for your batch plant, keep the storage area as clean and organized as possible.

Cleanliness

Some statistics have shown that more than 70% of all injuries at a facility are directly related to housekeeping issues. Keeping a precast plant clean is a constant battle but one worth addressing and tackling head-on. A plant's actions or inactions in maintaining a clean work area greatly affect its employees' safety and health and the environment, and that ultimately affects your bottom line.

It is neither complicated nor impossible to keep a plant clean and tidy. Housekeeping is a practice that is well within the

employer's and employees' control, but it involves teamwork and effort. By looking into the events leading up to an injury and the injury itself, you may find it was due to a housekeeping issue. Grease on the floor or on ladder rungs, bags of materials or supplies stacked too high, tools and hoses left scattered about, walkways or travel ways blocked or obstructed, dirty tools and machinery, spent welding rods rolling across the floor, cluttered work tables or work space, blocked fire extinguishers and water accumulation on work space floors can all cause slips, trips and falls. All are related to housekeeping practices.

Once you analyze past injuries, take a look at current conditions. Are there similarities from past incidents? Are these same poor housekeeping practices still an ongoing issue? Now is the time to take corrective action to prevent future occurrences.

Take a look at historical data and your past OSHA logs. If you had any injuries in the past two or three years, try to determine if they were a result of a housekeeping issue. Then dig out your workers' compensation claims costs for the same timeframe. Most likely you will find a deductible that you paid before workers' compensation kicked in. This is money out of your pocket and off your bottom line. If you're self-insured, this cost is all off your bottom line.

Now you can determine how much production, services and sales must be made to break even with the injury cost. It would be wise to disclose this information to all employees to show how everyone shares the cost of an injury, not just for the company itself but for workers, co-workers and families. Workers often do not realize how an injury affects others or how a good housekeeping plan will make everyone in the plant safer and less likely to be injured.

Quality management system

According to Phillip Crosby (1980), quality is free. He explains that it is actually all the "unquality" things that are costly. Every cent not spent doing the wrong thing is a penny sent to the bottom line.

Plants can avoid manufacturing subpar products by implementing a quality management system. The National Precast Concrete Association offers the "NPCA Quality Control Manual for Precast and Prestressed Concrete Plants" to aid the precast concrete industry in developing plant-specific programs. This manual, when used in daily plant operations, allows management and production personnel to understand and meet the requirements for manufacturing quality products. It provides practical information on adherence to accepted industry standards that helps provide consistency throughout a plant's operations. Specifiers and users of precast concrete products are constantly seeking ways to identify high-quality products. The NPCA Plant Certification Program is based on the premium quality control program outlined in the NPCA Quality Control Manual and is intended to assure that precast and prestressed concrete plants are capable of manufacturing quality products.

Continuous improvement is one of the fundamentals that is often neglected in the day-to-day grind. Most industrial management experts estimate that the cost of poor quality

typically amounts to 5 to 30% of gross sales (Archambeau, 2004). Some of these costs related to poor quality are easy to spot while others may be more difficult to pinpoint.

In terms of dollars and cents, repairs to a poorly made product cost money in materials and labor. When the piece is not repairable, you must dispose of it, and then you lose the value of the raw materials in that structure. Disposal itself also costs money, and then there is the cost of making the product again to meet the needs of the customer. But even these costs can't compare with the losses that come when customers lose faith in products that are of poor quality. Scrap, underutilization, lost sales, rework and warranty costs are all components included in the cost of poor quality.

Damaged goods

A common recurring example of an inefficient process is repair of concrete products. Due to improper pre-pour, production, post-pour, stripping and/or handling procedures, products sometimes become damaged in some way that requires repair. If proper procedures are not set up to prevent damage in the first place, after a while it may become a routine task in the manufacturing process. The cost is then absorbed by the plant as a cost of doing business, when in reality the company should find and resolve the root of the problem. The following items should be addressed to prevent recurring damage:

- Inspect forms prior to casting (repair or adjust forms, leakage, surface defects)
- Use the correct type and application of form release agents
- Use proper vibration equipment and techniques
- Inspect all lifting devices for safety and capacity
- Use proper handling techniques for cured products

Once all of these items have been addressed, implement a plan to ensure that any repairs are handled efficiently and don't require repetitive motion.

Corrective actions

A closed-loop corrective action system involves identifying and eliminating the root causes of problems. Here are the steps to a closed-loop corrective action plan:

- Clearly define the problem
- Determine the extent of the impact it has on the process
- Identify and eliminate the root causes
- Objectively evaluate the effectiveness of the action taken

When evaluating this model, materials, machines, methods and people should all be investigated to determine the root causes. Once eliminated, you will likely prevent recurrences of the problem. This in turn will improve your bottom line. ■

Evan Gurley is a technical services engineer with NPCA.



Precasters' Opportunities & Liability in Green Projects

Green or LEED-certification projects are not only a rapidly growing part of the North American construction market, but green building contracts have legal pitfalls that can affect liability for the contractor and precast concrete producer.

BY LANE F. KELMAN AND LORI WISNIEWSKI AZZARA



LANE F. KELMAN



LORI WISNIEWSKI AZZARA

Everyone's ears perk up when questions of legal liability in construction arise. With the increasing demand for greener, more sustainable buildings, the construction industry is rapidly evolving. A surge in green construction, with new LEED-related strategies and technologies, means greater market opportunities for the precast concrete industry. Along with these new opportunities, however, it is imperative that contractors and manufacturers thoroughly understand precast concrete's role in a sustainable project and how precast inherently contributes to achieving green project goals. Moreover, to protect their interests and the bottom line, producers and contractors must understand the unique risks and legal issues associated with green construction.

A review of the LEED rating system

Green building standards can be established by local, state or federal governments or through the adoption of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. LEED is a voluntary scoring system that measures and evaluates a building's sustainability. Because LEED is the most prevalent rating system, an in-depth understanding of point allocation and how precast concrete can contribute to achieving certification is critical to succeeding in this emerging market.

Developed by the U.S. Green Building Council in 2000, the LEED rating system provides building owners and operators with a framework to implement design and construction practices that reduce adverse environmental impacts and increase occupant health and well-being. The LEED rating

system exists for various forms of construction, including new construction.

- *LEED-New Construction (NC)* is a commonly used rating system for new construction and major renovation projects. Achieving LEED certification signifies that a project has independent, third-party verification for high performance in design and construction strategies, including sustainable site development, water efficiency, energy and atmosphere, material and resources, and indoor environmental quality.

- *LEED-NC* points are allocated as follows:

Sustainable sites	26 points
Water efficiency	10 points
Energy and atmosphere	35 points
Material and resources	14 points
Indoor environmental quality	15 points
<hr/>	
	100 points
Bonus:	
LEED innovation in design	6 points
Regional priority	4 points

The total points earned determine whether a project will be LEED certified as:

- Certified (40-49 points)
- Silver (50-59 points)
- Gold (60-79 points)
- Platinum (at least 80 points)

Why precast concrete can be green construction's "MVP"

Precast concrete's numerous green qualities make it the preferable choice for projects seeking LEED certification, as it:

1. Can be reused and recycled
2. Utilizes waste and recycled materials
3. Optimizes a building's energy performance
4. Is typically made from locally available materials

Not only do precast products relate directly to certain LEED credits, but they can make significant contributions to capturing other essential LEED points. Other areas in the LEED-NC rating system where precast concrete can play a critical role in helping a project achieve its certification goals include:

Sustainable Sites credits:

- One point for developing the site in a manner that protects or restores the habitat. Precast concrete is manufactured in a controlled environment and is rapidly installed, thereby reducing on-site construction disturbance, equipment, traffic, noise, emissions, workers and construction waste.
- One point for maximizing the open space. Lower-level precast parking garages located within a building minimize the building's footprint and allow for the natural habitat to remain undisturbed.

- Two points for the quantity and quality control of stormwater management. Precast concrete stormwater products limit the disruption and pollution of natural waterflow by managing stormwater runoff and reducing pollutants from construction sites. Precast concrete's strength and durability allows it to withstand water pressures inside the system as well as the external existing conditions. Precast concrete permeable pavers reduce runoff water, facilitating natural percolation into the soil.
- One point for reducing urban "heat island effects" with roof surfaces and one point for non-roof surfaces. Precast concrete's thermal mass and light color (including custom white, self-cleaning and smog-reducing concrete)¹ reduce heating costs, reflect solar rays and increase overall building energy efficiency. Precast concrete underground parking structures and their inherent strength (for supporting solar panels or green roofs) also reduce heat island effects and building footprints and increase overall energy savings.

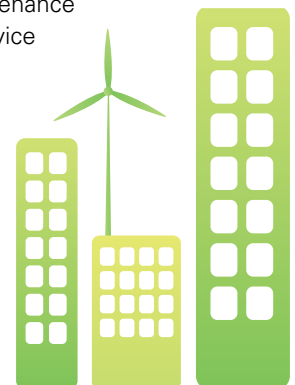
Energy and Atmosphere credits:

Buildings seeking LEED certification are required to establish a minimum level of energy efficiency and reduce the environmental and economic impacts associated with excessive energy use. The project must comply with certain building performance prerequisites in the Energy Standard for Buildings Except Low-Rise Residential Buildings (I-P Edition, ANSI/ASHRAE/IESNA Standard 90.1-2007) or applicable prescriptive measures in ASHRAE's Advanced Energy Design Guide.

- A maximum of 19 points can be awarded for optimizing building energy performance beyond the baseline in the prerequisite standard. Precast concrete's thermal mass and insulated sandwich wall panels help to increase building energy efficiency, which contributes to satisfying this prerequisite and obtaining critical points associated with this credit.

Material and Resources credits:

- Up to three points for maintaining the building's existing structure, including the walls, floors and roof. This credit's goal is to conserve resources and reduce waste and environmental impacts associated with new construction. The durability and adaptability of precast concrete can significantly aid in achieving points associated with this credit. Precast concrete's low-maintenance surface and resilience ensure a long service life, and precast can remain during renovation. Moreover, precast panels can be moved and reused without requiring demolition of the entire structure.
- Up to two points for permanently installing materials with preconsumer and/or postconsumer recycled content of 10 to 20%. Supplementary cementitious materials (SCMs),

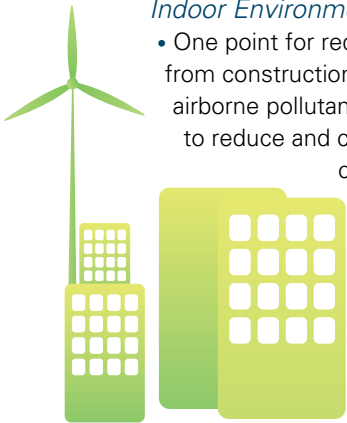


such as fly ash, silica fume and slag cement, qualify as preconsumer recycled material, whereas recycled concrete or slag are considered postconsumer recycled materials.

- Up to two points if 10 to 20% of permanent building materials are extracted, harvested and manufactured locally (within 500 miles of the project site). The use of local materials reduces fuel costs and transportation emissions and supports the regional economy. Precast concrete products are typically comprised of locally extracted materials and produced within 200 miles of the project site.

Indoor Environmental Quality credits:

- One point for reducing indoor air quality problems from construction and/or renovation work (i.e., dust, airborne pollutants, mold). The goals of this credit are to reduce and contain air pollutants generated during construction and to protect absorptive materials from moisture damage. Precast concrete is manufactured off site, delivered to the site in pieces (eliminating onsite concrete cutting), unaffected by moisture, and does not facilitate mold growth.



Innovation in Design credits:

- Up to five points for demonstrating exemplary performance (above and beyond the requirements set forth in the LEED rating system) and/or for exhibiting innovative performance in green building categories not specifically addressed in the rating system. For example, a project that exceeds the recycled content or regional materials threshold could obtain additional points under this credit. Precast concrete's sustainable characteristics make it an optimal green project choice for obtaining LEED certification.
- One point if a principal project participant (including the precast manufacturer) is a LEED-Accredited professional.

Green contracts: allocation of legal responsibilities & liabilities

Precasters and contractors know there is no one-size-fits-all standard form contract, and there is no exception for contracts seeking LEED certification or that incorporates green building practices or specifications. The language of any standard form building contract must be modified to account for the specific and unique owner requirements on a project. The contract should:



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1. Clearly define the project's goals and requirements, especially with respect to the building's operational performance and obtaining third-party, including LEED, certification.
2. Delegate green building responsibilities and identify the party ultimately responsible for achieving certification.
3. Identify the LEED points being pursued, how points will be attained, and the party responsible for record maintenance and submission to the certifying agency.
4. Specify methods for early planning/strategy meetings to ensure that the project's construction materials and methods will capture the necessary LEED points.

Precast concrete manufacturers and suppliers should be prepared to provide detailed documentation regarding their products' sustainability features and how the use of their products will contribute to LEED points and/or satisfy LEED criteria. Because precast concrete has the potential to contribute to a number of credits and points, there is an increased risk of liability when the product is specified for the purpose of obtaining particular LEED points and/or credits. If the contract documents are not properly drafted, the precast manufacturer or supplier could be held liable for delay in certification and/or failure to achieve the desired certification should the precast concrete not perform as originally anticipated.

With this rapidly growing green construction market comes increased risk and liability. Precasters and contractors must be proactive in thoroughly understanding LEED credits for which they can contribute, and they must be armed with contracts that clearly define responsibilities and the scope of work. When they do, they will be in a better position to avoid future disputes and guarantee that the project's green goals are met. ■

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¹ See the self-cleaning concrete article in the Fall 2012 issue of *Precast Solutions* magazine.

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A Refresher on Workplace Discrimination

Filings of discrimination lawsuits are at an all-time high. This article is a refresher on EEOC's prohibited employment policies and employer liability.

BY SUE McCRAVEN



As the owner of a small or medium-sized precast concrete production facility, you may feel confident that discrimination issues regarding sex, race or age are highly unlikely among your plant and office staff. But because employer discrimination lawsuits are at their highest levels ever and increasing rapidly, confidence in your management policies could be unfounded.

Employer retaliation tops the list

Litigation statistics from the U.S. Equal Employment Opportunity Commission (EEOC)¹ show that more than 100,000 discrimination charges were filed in 2011. Of the nine categories involving workplace discrimination – race, color, religion, sex (including pregnancy), national origin, age (40 or older), disability, genetic information and retaliation – there have been dramatic increases in discrimination claims across all categories due in large part to our more litigious society and the speed and ease of obtaining claim strategies and legal information via the Internet and social media. But it is retaliatory discrimination charges that have seen the largest increase of all, as claimants are generally more successful in recovering damages at trial. This is another way of saying that juries don't find the employer's position as credible or as sympathetic as the employee's position.

The causes of employment discrimination are easy to understand. Retaliation charges may result when an employee is subjected to management reprisal, reprimand, adverse reassignment or some illegal management action. An unjustified (poor) employee evaluation or an increase in plant or office surveillance (albeit well-intentioned) of an employee who has filed a harassment complaint

are examples of retaliation. The increase in age-discrimination lawsuits is partly due to our current national economic slump, particularly the hard-hit construction industry, which has led to many forced layoffs and a corresponding increase in age-related lawsuits. For example, a commonplace age-discrimination “no-no” (of which we are all familiar) is the posting of a help-wanted notice stating a preference for a “recent college graduate.”

Free bilingual training and guidance

Precast plant managers can take advantage of professional guidance at staff safety meetings. On a limited basis and at no cost, EEOC will present seminars on workplace discrimination and recommended management policies. Often, EEOC can provide bilingual staff for plant presentations. Excellent, no-cost explanatory documents, such as “EEOC Enforcement Guidance: Vicarious Employer Liability for Unlawful Harassment by Supervisors,” and “Questions and Answers for Small Employers on Employer Liability for Harassment by Supervisors,” are available online at no cost.²

Sexual discrimination in the precast industry

Management complacency about antidiscrimination policies and training can lead to costly litigation based on legal definitions of employer liability. Because most workers in the construction industry are men, sexual discrimination in hiring and workplace practices can almost seem justified. Running a typical all-male precast concrete production staff is no protection from gender-related lawsuits.

In conclusion, consider these not-improbable precast industry scenarios:

- A woman with experience and excellent qualifications applies for the plant sales and estimating position. You reject her application because most of your company’s big customers and long-time clients are more comfortable dealing with men.
- You’ve just hired a young and very attractive female receptionist to help out in the office during the busy summer season. Your production supervisor routinely puts his arm around the young woman’s waist when he stops in the office, making her feel uncomfortable with his unwelcome attention. ■

Test your knowledge of workplace discrimination

Here is a True/False test that you can take at your next staff or employee safety meeting:

1. The Supreme Court ruled that employers are legally responsible for any form of illegal employee harassment by plant supervisors. **TRUE OR FALSE?**
2. A supervisor is someone who makes hiring and firing decisions, not the person in charge of employee daily work activities. **TRUE OR FALSE?**
3. If you meet the definition of a “small business,” you can fulfill your legal responsibility by a prompt, thorough investigation of a worker harassment complaint. **TRUE OR FALSE?**
4. Many small businesses (fewer than 15 employees) are not covered by EEOC laws. **TRUE OR FALSE?**
5. Retaliatory discrimination lawsuits have seen a dramatic increase, as management retaliation is often easier to prove in court and because research has shown that juries are predisposed to disbelieve employers. **TRUE OR FALSE?**
6. The only important management policy on EEOC-related issues is a comprehensive company antidiscrimination policy. **TRUE OR FALSE?**
7. It is important to encourage your employees to report any incidence of perceived harassment as soon as possible so that management can take appropriate remedial steps before actionable harm occurs. **TRUE OR FALSE?**
8. As part of a traditionally male-dominated industry, construction work sites can create a number of unintended barriers for women who are increasingly entering the profession.³ Because of the generally small number of females in construction, production plants and work sites can create what many women may perceive as a hostile environment (inadequate access to toilets, PPE that is too large, unwelcome sexual comments and off-color jokes). **TRUE OR FALSE?**

Answers to T/F test:

- | | |
|--|---|
| 1. True. | 5. True. |
| 2. False. A supervisor is the person who has the authority to make employee job decisions (hiring, firing, promotion) or is in charge of daily plant production work. | 6. False. Management must also be able to prove that employees were aware of the company’s antidiscrimination policies and the process for reporting harassment. |
| 3. True. | 7. True. |
| 4. True. Title VII of the Civil Rights Act of 1964 covers discrimination actions (including retaliation) for companies with fewer than 15 employees. Individual states also have employment discrimination laws for small businesses. | 8. True. |

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

¹ <http://www.eeoc.gov/eeoc/statistics/enforcement>

² <http://www1.eeoc.gov/eeoc/publications/index.cfm>

³ <http://www.osha.gov/doc/accsh/haswicformal.html>



We're All in This Together

How to create an ownership-centric culture that holds employees accountable and rewards them accordingly for their efforts.

BY BRIDGET McCREA

Brad Hams' philosophy is simple: When employees have a little skin in the game, they'll go to bat for their employer more times than not. They'll treat the company as if it were their own, thus the name of his Denver-based business consultancy, Ownership Thinking. The concept is straightforward, but putting it into action in today's workplace typically requires a completely different mindset from what owners, leaders and managers are accustomed to.

"Our goal is to create organizations of employees who think and act like owners toward creating wealth which, of course, creates opportunity for the company," says Hams. He developed the Ownership Thinking model while serving as president of Mrs. Fields Cookies in Mexico in the early 1990s. For the last 17 years, Hams has been helping companies adopt that "culture of ownership."

Hams works with companies of all sizes and across various industries – including precast manufacturers. He says organizations that push employees to think and act like owners not only create more opportunities and wealth, but they also retain workers at a 200% higher rate than companies that don't.

"It's not just about creating wealth and improving financial performance," says Hams, who feels that companies can push

performance to new levels through a combination of the right people, education, measures and incentives. "It's also about creating extraordinary business cultures where people want to come to work every day."

The four components

Hams' business philosophies go beyond open-book management and employee ownership. He outlines the following four foundational pillars that he teaches to companies:

- 1. The Right People:** Ownership Thinking creates an environment that promotes learning and development, while increasing visibility and accountability. Your best people will excel, and your poorest performers are generally self-selected out by their peers.
- 2. The Right Education:** Employees are taught the fundamentals of business and finance so that they are better equipped to make financially sound decisions.
- 3. The Right Measures:** Rather than focusing only on lagging financial measures, an emphasis is placed on identifying the most critical leading, activity-based measures (Key Performance Indicators, or KPIs) and using them to forecast results on a regular, formal basis.

4. The Right Incentives: The process of employee education and focusing on the right measures in an environment of high visibility and accountability will increase your organization's profitability – guaranteed. "We can now design and implement a broad-based incentive plan, because it is self-funded," says Hams.

Those pillars caught Theodore W. Coons' eye last year after he picked up Hams' book, "Ownership Thinking." The timing was perfect, because Coons, president of Spillman Co., a forms manufacturer based in Columbus, Ohio, was already considering the issues of personal responsibility and accountability on a company-wide basis. Alex Freytag, partner and vice president at Ownership Thinking, was the right person to help Spillman Co. introduce and implement those concepts.

Freytag conducted a day-and-a-half seminar with the Spillman employees (two-thirds of them comprised management personnel) in April 2011. Through the exercise, the company came up with a list of KPIs – based on history, budget and actual performance – that it uses to create monthly "scorecards." It also developed an annual budget and had its managers come up with twice-monthly budget responsibility goals for their respective positions.

"We evaluate end-of-month numbers against both the budget and the projections," says Coons, whose team looks at KPIs like top-line sales, gross margin, number of invoices and the average value of each invoice. Results are shared across the entire company. And while Coons points out that Spillman does not run on an open-book management model, the 32-employee organization does share "a great deal of information, including detailed financials, with the management team."

So, you ask, what does Spillman Co. do to make its associates truly feel like they are profiting when the company meets and/or exceeds its financial goals? That's where the bonus pool comes in, according to Coons. Based on the company's book value at the beginning of the year, the pool includes a quarterly, minimum return that's used to pay for taxes, capital replacement and return on investment. Once that threshold is achieved for a given quarter, 20% of Spillman's net profit (before taxes) goes into the bonus pool.

"We then have a formula that's built on the base wage or salary of each of the associates, which in turn becomes the denominator in the equation," Coons explains. "We pay out half of that quarterly bonus in each of the first three quarters, and we hold back the other half just in case we have a bad quarter." The final installment is doled out after the year is closed out (typically in January or February of the following year) in an amount that equals 5/8 of the total bonus.

With about seven quarters of Ownership Thinking under its belt, Spillman – which has paid out quarterly bonuses for each of those seven quarters – is already seeing the results of its efforts. "Our associates are taking on more responsibility and are more accountable," says Coons. Communication among management team members has also improved. The firm's plant manager now holds weekly meetings with his associates, for example,

and Coons heads up two meetings per month where he talks openly with associates and managers about what's going on with the business.

At those gatherings, Coons says participants are asking more questions and contributing more information and opinions than they ever did in the past, knowing that those contributions count. Picking up items off the shop floor and reusing them instead of throwing them out, and developing more efficient office functions, have both been implemented as a result of those meetings.

"We're getting more suggestions about how to improve productivity and profitability than we were hearing two years ago," says Coons. "We're also seeing a big emphasis on waste elimination and have become a much leaner company as a result of the suggestions that we're listening to."

Convincing Spillman's associates to participate in the Ownership Thinking model was fairly easy, although Coons admits that some assumed it was another "flavor of the month" management technique that would quickly fall out of favor. But as more and more of the employees began seeing the financial benefits of the program in their own payments, that sentiment began to shift. "When someone sees a bonus check as a result of their efforts," says Coons, "it really helps enforce the program's value."

Creating an ownership culture

As Coons and many other company presidents have learned, employee buy-in is a pretty powerful thing. When workers feel like they're part of something, and that what they're doing really matters, they'll be more apt to make the right decisions. They hold themselves accountable, keep watch on what others are doing, and take myriad other steps to contribute to the overall health and wealth of the company.

Of course, it's not enough to set up a new incentive plan and hope that employees buy into it and start working a little harder, smarter and faster to help the organization achieve its goals. The transition to an effective ownership-centric company takes time and requires solid communication with all employees. It takes buy-in across all managers, owners, presidents and other decision makers. Without that support, the program will fall by the wayside quickly and things will "return to normal," says Hams.

When introducing the initiative, for example, Hams suggests doing a simple employee survey to find out what workers feel are the company's key issues from the financial, operational, external and human resources standpoints. "Employees see things on a day-to-day basis that leaders miss," says Hams. "This is your opportunity to gather a baseline of information on the company's issues and weave that information into your plan."

Surveys also make employees feel included early in the process and truly part of the team. "They help get buy-in and ensure that the program will be implemented successfully," says Hams. Employee training is equally as important and should be orchestrated across the entire team – not just in the leadership and management ranks.

Financial training is particularly vital, especially for workers who may not have dealt with financial statements and other accounting documents in the past. Hams, who has worked with 2,000 different organizations since founding his firm in 1995, says teaching employees the fundamentals of business and finance is a critical first step. Workers have to know how the company operates, how they fit into that scheme of things, and how they can contribute on both an individual and a team level.

"Every employee should go through a financial acumen training program," says Hams. "This gets them engaged and onboard with the initiative." When employees, managers and leaders are all in sync and working as one large ownership squad, the business rewards are measurable and significant.

For the business acumen training to be most effective, says Hams, it needs to go beyond simply displaying and explaining financial statements. "Most employees don't see financial statements, and even if they did they probably don't understand them," he points out. "Plus, most companies get their financials midway through the following month, when it's too late to do anything about them. They basically tell you the score at the end of the game, but they don't cover what went on during the game."

Getting to the next level

Brent Dezember, president at StructureCast in Bakersfield, Calif., knows the value of having a team of employees and managers who feel like they are part of the company. With an employee base that ranges from 50 to 65 persons, based on economic conditions, StructureCast utilizes a long-term financial plan based on quarterly objectives.

Teams of employees meet off site once every quarter to review and reset their goals according to performance. Within the production environment, for example, the KPIs include on-time delivery, sales per man-hour, and actual budgets for every

job. Financials are measured and reported weekly, and both management and production teams huddle daily for at least 15 minutes.

During those pow wows, team members focus on what's not being accomplished and the roadblocks that are standing in the way. "Our goal is to create a lot of very focused communication," says Dezember, "and to hit on the points that are holding the company back in order to come up with solutions."

Every StructureCast employee also participates in a profit-sharing bonus plan based on the firm's overall performance. And while he admits that the economy has made it difficult to distribute bonuses over the last few years, Dezember says giving employees responsibility over business performance – and then letting them share in the profits that are generated – is an important foundational aspect of the precaster's business model.

To companies interested in setting up ownership-centric cultures, Coons says "get ready to reveal some financial information" to those managers and employees who are expected to buy into the program. "Precasters in general are reluctant to do this, but it's a necessary step in getting the buy-in across your organization," says Coons, who adds that in order to be most effective, the initiative must also have the full support of the company's ownership ranks.

Without that support, it will surely fail. "The buy-in and the follow-through have to be there on the part of the ownership," says Coons. "This isn't a top-down approach to solving day-to-day issues on the shop floor or in the office. It has to be a team approach and a 'we're all in this together' mentality, or the results won't be there." ■

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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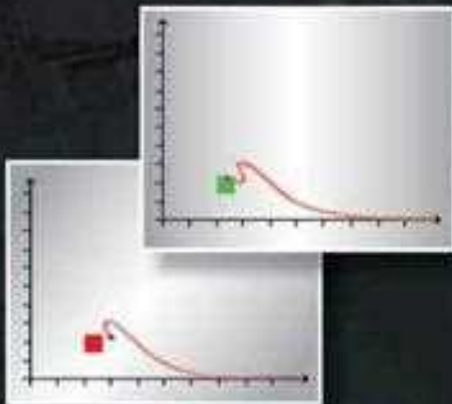
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ENDURING RELATIONSHIPS

STORY AND PHOTOS BY RON HYINK

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Practically since the day John Olson stepped into the plant at Huffcutt Concrete Inc. in Chippewa Falls, Wis., the company has been all about relationships. Henry Huffcutt, who founded the business in 1945, hired young man John in 1956 and quickly took a liking to him. As the bonds developed, Henry, who had no children of his own, began to treat John as a son. John became Henry's foreman and eventually purchased the company from him in 1968.

From there the company began to grow and prosper, and it was all based on the bonds and friendships that had been formed among employees, customers, suppliers and even other precasters.

"We're essentially a relationship company," confirmed Steve Olson, John's son who now serves as president of the

company. "You're selling yourself and your company and the products that come with it – they just gain that trust. So that's what we're about around here."

THREE-LEGGED STOOL

Through the years, Huffcutt Concrete has added products to serve the needs of the community and to provide a source of revenue as the demand for other products fluctuates. "We're basically a three-legged stool here," said Steve, referring to the three main products the company offers: septic tanks, agricultural products, and modular vaulted and restroom buildings.

Henry originally made concrete blocks and sold them to contractors, who built septic tanks with them. Along about 1957, after Henry hired John, they started making their





“I wasn’t going to expect anything from our employees that we weren’t going to do two-fold.”

— **STEVE OLSON** *President of Huffcutt Concrete*

PIONEERS OF PRECAST

Even a brief conversation with John Olson brings on a nostalgic rush that makes you long for the good ol' days. His generation

represents a time when customer service likely would have meant the difference between keeping or losing a customer's business. Workers were grateful for what seems today like pocket change after a hard day's work, and still they would bend over backward to earn your satisfaction. Though limited to the technology of the day, they set the bar for integrity very high – where there was a will, there was a way.

The will, resolve and values his generation represents and the ones preceding it carried them through enormous obstacles. Take, for example, the engineering feats of the Empire State Building and the Hoover Dam from the 1930s – built during the Great Depression. Consider also the major accomplishments in aviation, electronics and automotive styling, not to mention the war effort that propelled them into global recognition. It was all monumental stuff, and those at the forefront were pioneers in their own right.

That same mentality permeated across all industries, so the precast concrete industry was not without its own pioneers. Precast concrete was not widely used in North America until the '40s and '50s, and then the industry itself started to come together. It was during this time, in 1956, when John began his employment with Huffcutt Concrete Inc. "At that time we were making block septic tanks," he said, when contractors would buy the precast block to build the structures on site. "Then in about '57, we started making precast septic tanks. We first started making a 500-gallon septic tank, then started making larger ones."

Precast tanks, compared with those made of block, were no doubt of better quality and less labor intensive to install, although at the time they didn't necessarily equate to less labor. "In those days, we welded up our own boom trucks and we welded up our own forms," added John. More improvements came after John bought the company from Henry Huffcutt, the original owner, in 1968. By that time, the National Precast Concrete Association had been established to pull together all producers and suppliers and put some meat on the bones of the newfound industry. In 1970, John stopped in to visit Joe Wieser, founder of Wieser Concrete Products Inc. in Maiden Rock, Wis., who convinced him to join NPCA, which opened up a whole new world for Huffcutt Concrete and put him in touch with his longtime vendors including Spillman, Concrete Sealants and New Hampton Metal Fab.

John quickly made new friends with others in the industry, including Harry Hayward, E.C. Babbert, Frank Mader and William Coons to name just a few. "All pioneers in there," said John. "Those were the days we went to the post-conventions – they were as big as the conventions."

Post-conventions occurred in far-flung places such as Hawaii, Mexico City, Cancun, Jamaica, "and all over," said John. Socializing and traveling together became a part of their culture. "At 7 o'clock, we were down for breakfast and we were all dressed in sports coats and ties and wore them all day."

Time has drastically changed the industry since then, but certainly not for the worse. "It's amazing the progress that's been made from the time that I started and now, not only in products and so many different technologies – it amazes me what the guys do now," said John. "And the way they pour concrete now, it runs like water but they still get the strength. In our day, when it was more watery, you lost strength. And it's changing in every facet. They've really improved products – the quality of them is so much better."

A newer generation has its hands on the rudder of the precast industry now, but thanks to the pioneers who went before them, they are on firm ground and establishing new boundaries. "It's in good hands," said John.

¹ The Empire State Building held the record as the world's tallest building for more than 40 years. The Hoover Dam held the record as the tallest dam for 22 years.

² Joseph Wieser established Wieser Concrete Products Inc., Maiden Rock, Wis., and served as chairman in 1985 and was named the Yoakum Award winner in 1981. Harry Hayward established Colorado Precast Concrete Inc., Loveland, Colo., and served as chairman in 1995 and was named the Yoakum Award winner in 1998. E.C. Babbert established E.C. Babbert Inc., Canal Winchester, Ohio, and served as chairman in 1976 and shared the Yoakum Award in 1977. Frank Mader established Crest Precast Inc., LaCrescent, Minn. William Coons was president of Spillman Co., Columbus, Ohio, and was named the Yoakum Award winner in 1972. The Yoakum Award is the highest honor NPCA can bestow on its members.



THE UNIT STEP CONVENTION PRECEDED THE NPCA CONVENTION AND SET THE TREND FOR "POST-CONVENTION" SOCIAL ACTIVITIES. PHOTO CIRCA 1959

own septic tanks, and the company has continued to manufacture them ever since.

The second main product has to do with geography. "Here in northwest Wisconsin, we do an agricultural business – bunker silos, manure transfer, manure storage products," added Steve.

Both the septic tank and ag products are tied to private development, and so demand comes and goes with the robustness or flatness of the economy. The market for vault restrooms, on the other hand, typically relies on federal, state or municipal contracts, and that coincidentally has helped Huffcutt Concrete through the depressed economy.

"We got into the vault toilet business in 1987," said Steve. The area's power company owned the local dam and was required by the federal government to provide recreational facilities, which had to include a new vault toilet for their park. "At that point, they asked me if we'd sell them a septic tank, and they were going to get somebody else to build a block building. And I said, 'You know, we can just do the whole thing.' And so that's how we really got started," he said.

"That was well before I moved back," said Bill Olson, vice president and another of John's sons. Bill had worked out



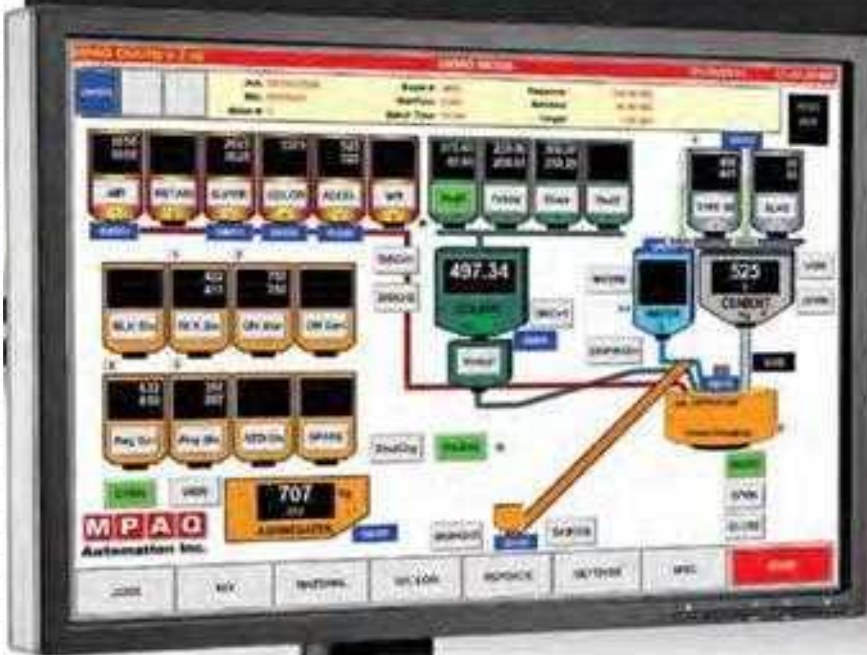
of state until 1993 when Huffcutt Concrete expanded to the point where he was certain he was needed. "They had always wanted me to come back, but I never really saw that the business was large enough to accommodate me," he added.

At first the restrooms were very simple structures and assembled on site. Huffcutt Concrete would manufacture and set up the walls and hire a carpenter to build a wood roof and

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do the finish work inside. "It gradually moved to where we started making the roofs out of concrete, and then precasting the modular buildings where they were completely assembled before they left the plant," Bill explained.

The company's vault restroom enterprise grew as customers, particularly the Department of Natural Resources, looked for something different or something bigger. "We started to accommodate them, then that created a market to sell to other people as well," said Bill. "It's been more customer-driven."

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grew to the point where the neighbors expressed their concern. "So then he purchased some land about a mile from here and had a nice little shop," said Steve. As the business grew, so did the manufacturing facility. "And then they literally built a shop over the top of that little wooden structure."

The business continued to grow and more additions were built, but once again space was getting small and cramped. "It was kind of a pie-shaped lot and started out with a small building, and we bought out a small block plant next door that went out of business," said Bill, adding that even the extra property soon became too small. "We had the plant space, and across the road we had some storage, and down the hill some more storage. We were scattered all over – it wasn't very efficient."

Finally, in 2004, the need for more expansion dictated a better strategy. "That's when we moved out here and started from scratch, which was kind of nice to be able to do that," said Bill. "It changed our company considerably. We were able to put in larger and more overhead cranes, and increase our production and efficiency."

The difference between the old and new facilities is dramatic. "We had a 1-yard turbine mixer over there, and so to turn out 10 yards was 10 batches, and that might take an hour," said Bill. "Now we can turn out a 10-yard load in one time." At the old plant, they partially relied on a local ready-mix company, but the new plant offered new solutions. "We decided to batch into our own ready-mix truck and make our own concrete, so it was considerably cheaper. We doubled up on our efficiency and cost effectiveness, so that was a great addition here at this plant."

The good news is that the new plant allows a lot more production space indoors. At the old plant, a lot of the work had to be done outside – forming, handling rebar, pouring, stripping. "And if the weather was bad, you didn't do it," said Bill. The bad news, if you can call it that, is the increasing demand for bigger restroom buildings. "So we're producing them in the plant, but we assemble them outside to where we can bring a crane in, lift them up, drive a truck under them and ship them out. Everything got bigger and heavier."

MILKING THE SYSTEM

Huffcut Concrete experienced enormous growth starting in 1996. "Then the great recession came in 2008," said Steve. "Our sales dropped 42% in 2008, and they actually dropped a little more than that in 2009. But by then we knew the rules, and so we closed our satellite plant and everything's been consolidated here. So we're fighting the fight pretty good now."

It was a very humbling experience for the company during 2009, Steve added, because the mindset for the previous 20 years was, "Build it and they will come." They had to freeze wages and the management took pay



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cuts, but they made a lot of adjustments to become leaner in production and inventory. "I wasn't going to expect anything from our employees that we weren't going to do two-fold," said Steve. "And that helped everybody understand how severe this was and how we were committed to fighting through it."

Steve gives most of the credit to management staff Marc Rowe, operations manager; John Cook, sales manager; and Ted Roshell, plant manager. "Credit also goes to all our employees for their commitment to make this work," he said.

Those relationships with the employees kept the company intact during those trying years, although the economic struggle continues. "Everything is down," said Bill, adding that some sectors come back in stages and fluctuate. "Agricultural was down, and then the milk prices went up and that boomed. There were a few years in a row when the milk prices were down – they were getting paid 1980 prices on their milk, and that wasn't even covering cost in some cases. So they were not spending any money."

The dairy farmers' desire to build and expand was there, but they couldn't justify it because of the economy. "And then all of a sudden, the milk prices climbed – and they were actually fantastic for a while, and we saw a huge flurry of work," said Bill. From a broad perspective, it seems odd that higher milk prices can actually spill over into the need for precast concrete, but money is funny that way. "There was work that people had

been waiting to do and they caught up a little bit, and so we've seen that. It's been pretty good."

FAMILY FOLLOWING

As Huffcutt is a family-owned business, John's sons Steve and Bill started working in the plant during their teen years. "We all grew up in the plant," said Bill. "In high school, as soon as we were old enough to get a work permit, that was our summer job."

Work started the day after school let out for the summer, and continued right up until the new school year started. "We didn't ask what hours to work or what our schedule was – it was whenever we were told to go to work and whenever we were told to go home," said Bill, noting that such a work ethic was expected at that time.

"Back in 1976, we were a union shop, and they took a strike – and we were a small company," said Steve. "For 13 weeks during that summer, I'd deliver tanks with my dad, my mom ran the office, my sister was 16 – my sister was the mixer person. My brother-in-law helped us out that summer as well. Bill and my youngest brother, Scott, set up forms, and we continued the business."

Eventually the strike was settled, and in the mid '80s, because of the positive relationship the company had with its



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workers, the employees voted to decertify the union. "So there again, it goes back to relationships," said Steve.

There are no sons to take over the business in the future the way Steve and Bill took over from their father, although Steve has four daughters – and all of them have worked in the plant. "They were actually general labor in the plant," said Steve. "I wanted to teach them, first, a work ethic, and they were also getting a paycheck, so it supplemented their college education."

Working on the production floor rather than in the office was by choice. "When my oldest daughter started working here, she said that's fine but I want to wear a hardhat, I don't want to work in the office," Steve explained. Daughter No. 2 worked for four years and actually is still connected with the business. "She was our first quality control manager when we became an NPCA certified plant in 2006. She is ACI Level 2 certified." The second-oldest now serves as marketing director from her home in California, where she established and still maintains the company website and puts together marketing material.

As with any family business, John owes a lot to Virginia, his wife of 61 years. Steve also is thankful for the support he gets from his wife, Deb. "My wife helps me keep perspective during the good and the bad," said Steve.

EAU DE ANGORA

"With a lot of our buildings, we call it putting perfume on a goat," said Steve, explaining how they can manufacture a concrete vault or restroom facility and make it more aesthetically pleasing, depending on the purpose of the building,



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at more of the exposed aggregates or the natural colors. "If we're putting it in as part of a playground centerpiece, then we're going to dress it up and make it more colorful," said Steve.

Schools have caught on to the benefits of precast concrete buildings, and so Huffcutt Concrete has taken orders for high school sports settings, such as concession stands, equipment storage and restrooms. "You might see a building come out of here that's purple and gold and all kinds of weird colors, but those are the school colors," said Bill. "They send us a paint chip, and that's what we make. We don't pick the colors!"

Another high school built a new football field and needed restrooms and ticket counters. "Their school mascot is

its surroundings and the desires of the customer. "When we sit down with our customers, they want precast concrete structures for all the right reasons – for storm resistance, for vandal-resistance, for longevity. But they also want it to aesthetically look like it belongs in whatever setting it is."

If the building is to be set in a scenic wooded area, as in a park, it should blend in with the background. Then they'll look

the Railroaders, and so we actually designed their building to look like a railroad depot," said Steve. "We can offer a lot of flexibility. We're not a cookie-cutter company, so to speak, so we can give them some uniqueness." Clients can come in at the planning stages to explain what they want and pitch their ideas. "Then we try to incorporate that into something with practical use."

IT'S ALL ABOUT RELATIONSHIPS

The relationship precept extends even to other precasters. Steve and Bill have made many acquaintances in the industry, and many of those were handed down from their father who made his own acquaintances whose sons also took over their respective businesses. "Obviously we're competitors," said Steve. "We will compete daily like it's nobody's business. But we all have that same common denominator, and so we'll look out for each other a little bit."

For a small company like Huffcutt Concrete, competition can be intense, but the pride and integrity they invest into everything they do places them on a par with other, larger companies. "At the end of the day, I don't care if we are selling widgets or precast concrete, a lot of it has to do with the relationships and the trust that we build with our customers and employees," said Steve. "With our septic tank business, for example, our customers trust that we are going to stay ahead of what the industry is doing and provide them with not just the septic tanks, but the accessory products that go with them, so they stay on the front of that curve. And so there is a trust there, which we value." ■

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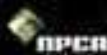
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5 Steps You Can Take by Week's End to be More Sustainable

BY DOUGLAS E. RUHLIN, CCPF, LEED GA, REM, CEA

Does the word "sustainability" strike fear in your business relations? Surely you have heard that more and more contractors are digging deeper to find suppliers that can document how their wares meet sustainability guidelines, especially where LEED points may make the difference in getting the bid or not. You may say to yourself, "I just don't have time right now," or you may think that becoming more sustainable means a long, complicated and expensive program involving a lot of changes to your facility. This is not necessarily the case!

Here are five actions you can take right now, before the end of this week, that will take you down the path toward a more sustainable plant or company.

1. Develop a corporate sustainability policy. Plenty of examples are out there. My advice is to take a look at what others are doing in your industry and go from there. Don't plagiarize them, but don't think you need to reinvent the wheel either.
2. Create a sustainability team. For now, that might be you and hopefully one or two others. Have a brief meeting to start some discussion. Admitting you know little about sustainability as a group is a good starting point, since you

can learn together. Make a brief action plan, and assign some duties – such as "search the internet and find out what this sustainability thing is all about" – then schedule another meeting.

3. Write down your key resource usage areas, and make a plan to look into them to see how you might reduce use. This should certainly include energy use (including electrical use, fuel use and engine efficiencies) and water use to start, but you might also include air emissions, recycling activities, etc.
4. Put together a list of your vendors, and make plans to inquire about their sustainability programs. Your actions include your vendors. Hopefully you are buying from those who conduct their operations in a sustainable manner as well – if not, you may want to consider other vendors. This would be a great task for a sustainability team member.
5. Review your environmental regulatory compliance level. Compliance is not often mentioned as part of overall sustainability, but receiving an environmental violation will do a lot to damage any claims you make about being green. So why not make sure you're not missing anything or falling short somewhere?

These simple steps, which you can do in a relatively short period of time, will begin to build a great foundation for your sustainability program. From here, you can begin to build your program, and even branch out into other areas such as social responsibility and economic considerations.

But for now, why not just start with these five simple steps. ■

Douglas E. Ruhlin, CCPf, LEED GA, REM, CEA, is an environmental and sustainability consultant with Resource Management Associates. He can be reached at doug@RMAgreen.com or (609) 693-8301 for questions or assistance with sustainable practices, product and plant certifications, and complete environmental services for the precast concrete industry.



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Secrets for a Stress-free Plant Audit

Do you get the heebie-jeebies just thinking about your plant certification audit? Here's the secret for nixing those exam jitters: Know what to expect and how to respond.

BY PHILLIP CUTLER, P.E.

Hey, boss ... the NPCA auditor just showed up in the lobby for our plant inspection! What do we do?" How many times have you heard this?

We often hear plant reactions to certification audits, and most are based on fear of the unknown: "What will the auditor find?" "How will they grade us on our critical requirements?" In rare cases, plants may not be prepared for their inspections and worry that they will end up on probation – or worse yet fail their inspection altogether. But from NPCA staff experience, there is no need to be stressed when the auditor arrives for your annual plant inspection.

So, what can you expect on the day of your unannounced plant inspection? Here are some tried-and-true tips to take the anxiety out of plant-certification audits.

How are auditors qualified?

You can expect that the the third-party auditors have been thoroughly trained in the NPCA Plant Certification Program and your expectations of the plant inspection. They know the proper conduct for an NPCA auditor and are well-versed in the content and program requirements in the NPCA QC Manual. NPCA plant auditors receive face-to-face training each year. If the auditors do not attend annual training, they will not be allowed to perform plant inspections for NPCA during the subsequent inspection year. Auditor training is conducted prior to the beginning of annual inspections for a given year by members of the NPCA Quality Assurance Committee and NPCA technical staff in a classroom setting and in an operating precast plant.

What to expect on "test day"

On the day the auditors arrive for your annual unannounced inspection, expect that they will



NPCA file photo

typically arrive early in the morning and ask to speak to someone in plant management. They will introduce themselves to you, explain the purpose of their visit and briefly describe what they will be doing throughout their visit.

Some precast concrete plants require that a staff liaison accompany and assist the auditors. Other production facilities simply let the auditors go about their business. In either case, expect auditors to inquire about access to the plant's internet and the availability of a printer to provide hard copies of the preliminary report. Arrangements are made for the close-out interview at the end of the day.

Following introductions, most auditors will ask to tour the plant to get a general overview and feel for the size and layout of the facility and to organize their thoughts prior to diving in. As most plants are stripping out first thing in the morning, the initial walk-through may incorporate an extended visit to the production areas in order to view post-pour operations.

Throughout the day, expect the auditor to spend time in each area of the plant and to take a detailed look at plant records. Auditors should spend the bulk of the day on the floor witnessing plant processes, balanced with the appropriate amount of time looking at records and the plant-specific QC manual.

Get answers to any problems

Primarily, the auditors are at your plant to perform your annual inspection. However, it is also an opportunity for you and plant personnel to ask questions about your specific processes and request that the auditors explain any specific suggestions, improvements or experiences that may be helpful to you and your staff. Certification program requirements do not allow auditors to make specific recommendations on how to pass audit requirements in a professional consulting capacity. In training, however, auditors are permitted and encouraged to share their expertise and experiences with the plant by offering a variety of suggestions for solving a problem or improving plant processes.

Make sure that you take full advantage of this opportunity to share your own experiences and obtain the auditors' perspective for manufacturing quality precast concrete products.

Make the exit interview work for you!

Now, about that exit interview, here are some typical staff reactions:

"Hey, I noticed that you gave us a deficiency for missing aggregate gradations – what gives?"

"The last auditor in my plant said we were all good!"

"Why are you giving me this as a deficiency and they didn't?"

Have you ever asked questions like these of your NPCA auditor? My guess is most precasters have had similar questions at one time or another. Make good use of the exit interview! Getting answers to your specific questions or concerns is one of the most important reasons why the exit interview is such an integral part of annual plant inspections.

The printed preliminary report provided at the end of the inspection day (or the hard copy of handwritten deficiencies if your internet server is down or if the auditors have been refused access) is the basis for a constructive and successful exit interview. This is why it is to your advantage to graciously invite the auditor to print and distribute his or her preliminary report.

The exit interview is your moment to ask the auditors to explain why the plant's processes were evaluated in a particular way. It's your last chance to submit evidence of compliance with a particular requirement. The exit interview is an opening to clarify any plant-specific issues with the auditors and to share your experience and perspective on quality production practices.

Use that preliminary report to your advantage!

The preliminary report represents – quite closely – the final report the plant will receive from NPCA upon completion of a supervisory review by the inspection

agency's principal auditor. Thus, the exit interview is the plant's sole opportunity to affect change in the final outcome of the audit.

If there happens to be a disagreement between the plant and the auditors on a particular requirement that cannot be resolved, plants are encouraged not to sign the exit interview sheet or to make specific notations expressing contention with certain aspects of the audit. Disagreement is not a bad thing, it is simply a difference of opinion, and within the program there is a framework for an appeal process to resolve these issues. The appeals process will be addressed in a subsequent Precast Inc. "Quality Assurance" article.

Remember, like most things in life, you get out of the audit what you put into it.

For additional information or questions please contact Phillip Cutler at pcutler@precast.org or (317) 571-9500, or toll-free at (800) 366-7731. ■

Phillip Cutler, P.E., is NPCA's director of Technical Services.

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NPCA Convention Wrap-Up



NPCA ELECTS RAINERO COLES AS 47TH CHAIRMAN

Members of the National Precast Concrete Association elected Mimi Rainero Coles as the chairman of the board at the NPCA Annual Meeting Oct. 6 in New Orleans. Rainero Coles, a longtime member of NPCA with Bristol, Va.-based Permatile Concrete Products, will lead NPCA for the next 12 months as the 47th chairman in the association's history.

MIMI RAINERO COLES

Also elected to officer's positions were chair-elect, Brent Dezember, StructureCast, Bakersfield, Calif.; and secretary/treasurer, Michael Tidwell, Bartow Precast Inc., Cartersville, Ga.

Elected to the NPCA Board of Directors for three-year terms were: Paul Heidt, Garden State Precast Inc., Farmingdale, N.J.; Michael Hoffman, Lindsay Precast Companies, Canal Fulton, Ohio; Jonathan Ohmes, Champion Precast, Troy, Mo.; and Terri Rondeau, Besser Co., Alpena, Mich.



ROLAND LINDSAY PRESENTED PRECAST INDUSTRY'S HIGHEST HONOR

Roland Lindsay, one of the early leaders of the National Precast Concrete Association, was honored at the NPCA 47th Annual Convention in New Orleans with the Robert E. Yoakum Award.

ROLAND LINDSAY

Founder of the Lindsay Precast Companies, Roland and his wife, Linda, were at the very first NPCA Convention held in Dayton, Ohio, in 1965. They were among the small group of precasters and suppliers who helped launch NPCA and have been heavily involved with the association ever since. Roland chaired NPCA in 1988, and two of his executives have also chaired the association: Tim Gesaman in 1999, and Randy Lindsay-Brisbin in 2008.

Lindsay started his precast company in the early 1960s and has grown it into five NPCA-certified plants in four states with

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a combined 350 employees and a diverse suite of more than 200 products. Included among those products are high-strength concrete vaults and vault doors used by banks across the country. Lindsay has even shipped product overseas to Russia, China, South America and Europe.

Lindsay was honored at an NPCA event held Oct. 6 at the National World War II Museum in New Orleans.

HOSKIN AWARD PRESENTED TO TOM ENGELMAN

NPCA presented its annual Douglas Hoskin Award for membership development to Tom Engelman of Bethlehem Precast. Engelman, who served as NPCA chairman of the board for 2011-2012, sponsored the most new members during the previous 12 months to earn the award.

Engelman was honored at an NPCA event held Oct. 6 at the National World War II Museum in New Orleans.



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CONVENTION HIGHLIGHTS

Roaming along the fringes of the NPCA 47th Annual Convention, NPCA's candid camera captured some of the action. The convention was held Oct. 3-6 in New Orleans. Here is a sampling of what it found.



THE NPCA 47TH ANNUAL CONVENTION IN NEW ORLEANS WASN'T ALL BUSINESS. SANDWICHED IN BETWEEN A FULL SLATE OF MEETINGS, EDUCATION, EXHIBITS AND ANNUAL MEETING ELECTIONS WERE A PLANT TOUR TO GAINEY'S CONCRETE PRODUCTS THAT FEATURED THE FULL FLAVOR OF LOUISIANA (GATORS AND ALL), A HISTORICAL BICYCLE TOUR OF NEW ORLEANS, THE PASSING OF THE CHAIRMAN OF THE BOARD GAVEL FROM TOM ENGELMAN TO MIMI RAINERO COLES, A SILENT AUCTION BENEFITING THE NPCA EDUCATIONAL FOUNDATION, BOARD OF DIRECTORS AWARDS, AND THE PRESENTATION OF THE ROBERT E. YOAKUM AWARD TO ROLAND LINDSAY (SEE PAGE 36). ATTENDANCE TOPPED OUT AT 398, WHICH MADE IT THE SECOND-LARGEST CONVENTION IN NPCA HISTORY. THE NPCA 48TH ANNUAL CONVENTION WILL BE HELD OCT. 9-12, 2013, AT THE HOMESTEAD IN HOT SPRINGS, VA.



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NPCAEF deadline approaching

The National Precast Concrete Association Educational Foundation is a scholarship program that supports students in construction, civil engineering and architectural programs. The scholarship program is open to anyone, although it is a great opportunity for aspiring college students among the families of those employed in the precast industry.

"I'd like to encourage you to promote the scholarship program within your plants," said Doug McLaughlin, president of the NPCAEF Board of Directors, at the NPCA 47th Annual Convention in New Orleans in early October. "Given the high cost of college these days, it can provide a much-needed stipend to a young person."

The deadline for scholarship applications for the next academic year is Jan. 1, 2013. The scholarship amounts are up to \$2,200 per academic year for undergraduates and \$2,500 per academic year for graduate students.

A downloadable poster like the one on the facing page is available on the Foundation website¹ that can be posted in precast plants or distributed to any students who may want to apply.

"There is no room for waste in our industry. Given the high cost of college these days, it can provide a much-needed stipend to a young person."

– Doug McLaughlin, *president of the NPCAEF Board of Directors*

The 2012 Foundation scholarship winners were Brian Dilley, Provo, Utah; Travis Wieser, Wisconsin Dells, Wis.; and Irene Kurtz, Easton, Pa.

Also at the convention, the Foundation's Board of Directors elected Darryl Cloud, Concrete Sealants Inc., as Foundation president-elect. Barry Fleck, A.L. Patterson Inc., began his two-year term as president, and McLaughlin, U.S. Concrete Precast Group, completed his two-year term. ■

¹ <http://precast.org/foundation/wp-content/uploads/2012/09/NPCAEF-Scholarship-Poster-12.pdf>

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(including engineering, architecture and business degrees with
an intent to enter the precast industry)

Contact information:

E-mail Marti Harrell at
MHarrell@precast.org





A BUBBLEDECK PANEL ARRIVES FROM THE OLDCASTLE PRECAST - SAN DIEGO PLANT.
Photo Courtesy: Boora Architects www.boora.com

Spheres of Influence

A new hollow-core slab technology makes use of recycled plastic spheres to offer innovative design solutions for an open floor plan at a California college.

BY DEBORAH R. HUSO

When officials at Harvey Mudd College decided to build a new teaching and learning center, they wanted to update its 1950s look. The college leaders envisioned a sustainable structure with naturally lit open spaces that would preserve the predominant concrete architecture of the campus. The challenge was to create large open spaces in classrooms and lecture halls without the interruption of columns and beams. The project's design-build team found the solution in BubbleDeck, a new hollow-core slab technology that allows for extensive spans of floor and ceiling without typical column supports.

Although it was the first in California and one of the first in the United States to make use of BubbleDeck technology, the product has been used successfully in Europe, Canada and Australia. The college selected the BubbleDeck technology mainly because it helped meet the school's goals for open floor

plans and sustainability with a reduced construction timeline. In addition, the BubbleDeck system offered easier construction within the tight parameters of the job site. *(For a description of the technology, see the sidebar "What Is Bubbledeck?")*

Building up to a new design

Founded in 1955, Harvey Mudd College (HMC) has maintained a very uniform, mid-century aesthetic and has done little building since its founding. The teaching and learning center is the college's first major construction project in decades, and, as Josh Brandt says, "They knew they needed to step forward design-wise."

Brandt, project architect with Boora Architects and designer of the new structure, points out that many of the school's existing buildings are dark with low ceilings. He says one of his

firm's major goals was to "provide a building that reflected the quality of the work going on inside"—that is, HMC's status as an engineering school. The objective was to provide as much height and daylighting as possible within the building's classrooms.

Brandt says Boora Architects anticipated using concrete from the start. "All the other buildings on campus are concrete, so there were aesthetic reasons for using concrete," he explains. More importantly, concrete offered the benefit of fireproofing without additional finishes. However, Brandt says typical designs that use a flat-slab concrete system would have been really limiting. The building presented a significant design challenge with its large classrooms for up to 50 people and the desire to maintain open space without columns. It was the structural engineer, KPFF of Los Angeles, that introduced the design-build team to BubbleDeck technology.

"A First" for precaster and contractor

Oldcastle Precast – San Diego took on production of the BubbleDeck slabs after learning about the technology from BubbleDeck North America. "We're known for taking on unconventional projects," explains Todd Ebbert, Oldcastle Precast – San Diego's general manager.

For Matt Construction, the general contractor, this is its first BubbleDeck project. "The precast work we've done in the past has been vertical systems," says Hertzberg, general manager at Matt Construction. "This is the first horizontal structural deck we've done."

Ebbert says the HMC project has been ideal for BubbleDeck, because it calls for an open floor plan with high ceilings. HMC is an engineering school, so the BubbleDeck slabs will be exposed, revealing "raw concrete as ceilings," Ebbert notes, "and in most cases, plumbing and electrical will be exposed as well." Seeing the configuration of building utility systems provides a valuable experience for budding engineers.

Scheduled for completion in fall 2013, the HMC project will have an interior courtyard and feature 360 BubbleDeck panels, about 100 floor panels and 58 panels on the roof. The building's four floors, including one subgrade level, will contain 90,000 recycled plastic bubbles, totaling 70,000 sq ft of surface area. Brandt says that unlike most projects involving precast concrete components, this one has not benefited from production repetition. In fact, he says, there is pretty much "zero repetition" in the size and shape of the slabs, which are basically a series of C and V shapes.

How the system comes together

The project team admits this first experience with a new technology comes with a steep learning curve. The diverse panel configurations "can be tricky" and consequently required careful production planning. "The underside of the deck is smooth, and it looks gorgeous," but to achieve that smooth surface for the building's ceilings, J boxes for light panels had to be precast into the systems, so there is significant pre-planning involved to make it work. "Everything had to be set according to a fabrication schedule."

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What is BubbleDeck?

BubbleDeck is the invention of Jorgen Bruenig, who devised the first biaxial hollow slab (now known as BubbleDeck) in Denmark. Since then, BubbleDeck has been taking off “in a big way” in Europe, according to Jerry Clark-Ames, manager of BubbleDeck North America. The technology moved overseas in 2005 with the first projects going up in Canada. There have also been numerous successful BubbleDeck projects in Australia, Malaysia and Brazil.

“Most projects in North America have been for floor plates,” Clark-Ames says. His company does not manufacture the slabs themselves but delivers materials for making them to an approved precaster. “BubbleDeck doesn’t usually conflict with a precaster’s existing market,” he adds. “Most precasters’ stuff tends to be single-direction plate as opposed to BubbleDeck, which is a two-way plate.”

The production process for BubbleDeck begins with the assembly of cages to hold the plastic spheres that serve as the slab’s hollow core. Clark-Ames says there are two slats of steel mesh per panel. Basically, the mesh is a welded-wire fabric with an offset spring. Precast producers install a lattice girder in the longitudinal plane of the panel formwork and then add the hollow spheres. A top mesh locks everything together. The cages are then set in forms containing 2.5 to 3 in. of fresh concrete. A typical panel is about 8 ft wide by 30 ft long, about 250 sq ft.

The system uses a third less concrete than a traditional slab and does not require special concrete. “You can use standard products like 5,000 psi self-consolidating concrete,” Clark-Ames says. He says BubbleDeck can represent a substantial cost savings for large decks with a 12-in. or greater slab thickness because of the reduction in concrete and construction time. “You can put all the panels together in as little as two days,” he notes. “You’re taking labor from the job site and putting it in the factory.”

Spancrete first to use BubbleDeck in U.S.

BubbleDeck made its U.S. debut in 2011 with the construction of an underground walkway at the University of Wisconsin-Madison’s La Bahn Arena. The open-space walkway had to be able to support a road overhead that would safely carry an 80,000-lb. emergency vehicle.

Clark-Ames explains that the walkway called for large, self-supporting spans able to carry significant dead and live loads. “It was an immense amount of weight over a large area,” he says. The design-build team for the project, led by Wisconsin-based general contractor Findorff, looked to BubbleDeck to provide the needed span structural strength without traditional columns and beams.

Spancrete, the project’s precaster, made two dozen 21-in.-thick panels for the walkway’s 12,000-sq-ft ceiling, each holding the 16-in.-diameter recycled plastic spheres. “There was quite a learning curve associated with this project,” says Clint Krell, director of sales for Spancrete. “But this product is already engineered when we get it. The bulk of our cost is labor.”

For more information, visit www.bubbledeck.com.

Hertzberg says he’d be willing to take on another BubbleDeck project but offers advice for other contractors. “The best thing to do is to actually view a project to see how simple it is, how beautiful the underside is, and how wide the column spacing is.” He emphasizes the need to be part of the planning process early on, to work with engineers before panel fabrication begins

to determine the size of panels and locations of floor boxes. “BubbleDeck is a state-of-the-art technology from an aesthetic standpoint,” Hertzberg adds. “It’s amazing.”

Brandt agrees with Hertzberg in defining the major challenge as coordinating mechanical, electrical and plumbing into the slabs. “You have to make decisions a lot earlier in the process,” he says.

The BubbleDeck slabs arrive on the job site partially assembled and have a 2- to 5-in.-thick precast concrete base embedded with a reinforcing steel cage securing the hollow plastic balls with each plastic sphere precisely spaced and locked in position. The honeycomb shape of the cage adds strength to the slabs. On site, the slabs are connected with steel bats and topped with a second wire mesh (for additional strength) before concrete is poured over the balls to create the smooth finish of the building floors.

In the HMC project, five sphere sizes are used in slabs ranging in thickness from 9 in. to 20 in. All the spheres, or bubbles, are made from recycled plastic. Brandt says 13.5 in. is the typical slab thickness. BubbleDeck’s precast architectural base serves as the finished ceiling for classrooms, offices and lecture halls.

Panel sizes are based on what can fit on a truck, so most are 10 to 12 ft wide and 40 ft long, with four panels transported per truck. Each precast concrete panel with its steel-caged bubbles weighs between 9,000 and 15,000 lbs. Slabs are trucked to the job site and installed using a 161-ft crane. Hertzberg says his construction team can install 50 panels in eight hours, adding rebar between panels. Installation of the reinforcing steel takes about two weeks plus an additional two days to pour and cure concrete around the spheres.

According to Hertzberg, the crews use a 2-in.-wide construction joint every 40 to 50 ft of panel to “allow room for error.” Crews also install floor boxes for electrical outlets in the classrooms and lecture halls, a process that often requires the removal and replacement of some of the spheres.

BUBBLEDECK PANELS ARE PRODUCED BY SETTING THE STEEL-MESH-ENCASED PLASTIC SPHERES INTO 2.5 TO 3 IN. OF FRESH CONCRETE.

Photo Courtesy: Spancrete www.spancrete.com



Three advantages of BubbleDeck systems

- 1. Open floor plan and finish control:** The reason BubbleDeck is attractive to designers is because the slab carries its self-weight (without reliance on load-carrying columns and beams), allowing for more extensive and open floor plans. In the case of the HMC project, a traditional precast concrete (or cast in place) structure with support beams would have increased the building's height and required closer spacing between columns, thus disrupting the available open interior space envisioned by the client. "Aesthetically, we were excited about the level of control over finishes by having it done in the factory," said Brandt.
- 2. 35% less concrete, same strength:** The system is designed to take the dead weight out of the center of a slab by filling it with plastic bubbles instead of concrete. One of the major advantages of BubbleDeck is that it uses 35% less concrete than traditional floor systems, yet has the same strength and more flexibility in terms of design.

- 3. More sustainable construction option:** BubbleDeck uses less concrete than traditional concrete floor systems, offers a more sustainable construction option, contributes less CO₂ to the atmosphere in the manufacturing process and also meets sustainability goals through the use of recycled plastic spheres. The spheres could be recycled yet again should the building be demolished or renovated in the future. The dead air space in the hollow spheres provides insulating value and can be injected with foam for additional energy efficiency. ■

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

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Precast Concrete Can Be Habitat-Forming

A NetZero Habitat for Humanity home in Canada is hoped to become the prototype for the future of sustainable housing.

BY SUE McCRAVEN

Canadian engineers and architects have created a structure unlike any other in North America. Using the latest energy-efficient designs, materials and technologies, this experimental, one-of-a-kind building will house two families in cooperation with Habitat for Humanity Edmonton, Alberta. But this prototype's purpose is more than humanitarian. The energy use of the occupied home will be monitored for three years, with the test results serving as both a learning experience in NetZero¹ design and construction and as a model for the future of economical, sustainable housing. Given Alberta's harsh winters – where peak low temperatures reach -30° F – this project will serve as a severe test of energy efficiency.

Habitat for Humanity Edmonton teamed up with Lafarge North America and Stantec, an Edmonton-based consulting firm, to build this first-of-its-kind, NetZero home. Klaas Rodenburg, sustainable design coordinator for Stantec, said, "This NetZero prototype can be mass produced and shipped to other locations at significant cost and time savings." The project collaborators hope to attain LEED Platinum-Certified Home designation from the Canada Green Building Council.

How to design a zero-energy home

The design of the Edmonton home is so efficient that, over

time, the resident families should receive no heating or electrical bills at all. Instead, they will rely completely on the home's renewable solar and geothermal systems for all their energy needs.

The home generates its own solar power on sunny days during the summer and returns the collected solar and geothermal energy to the power grid for storage. During the winter season, the residents obtain their heat and electricity by drawing on the accumulated energy in the power grid. Energy transfer from the fluid in the underground geothermal pipes delivers heat for warmth and water while the photovoltaic rooftop panels provide electricity.² The duplex's interior finishes use sustainable materials throughout as well.

Rodenburg explains that, in terms of energy savings, the precast building envelope is the most important element of the NetZero home design. "Up to this point, a zero-energy house has been only engineering theory. But we hope to prove the energy efficiency of the Edmonton home's performance through monitoring and testing."

MIT versus "greenwashing"

Until now, most claims of energy efficiency and sustainability have been just that: claims. In some cases, exaggerated

performance claims are called “greenwashing” as they are not supported by test data. To remedy this situation, Lafarge and Stantec engaged the Massachusetts Institute of Technology (MIT) to perform a third-party, objective, 24/7 monitoring study on the Habitat for Humanity home while it is occupied and in normal use by the resident families. The hope is that MIT’s test results will provide proof of the prototype’s energy-efficient performance and matchless design. An example of one test, said Rodenburg, will be “an air-blower door test to generate data on heat loss” through entranceways.

How different families use energy


Monitoring the energy performance of the NetZero duplex home during a three-year occupancy will provide important information for designers. Performance data will compare each family’s energy use and will also see how results compare with Edmonton’s typical wood-frame housing. Results will reveal how many Joules of energy are transferred for every square inch of precast concrete used in construction. And because Edmonton’s winter temperatures average a bone-chilling 11 F, the energy performance of the prototype’s design and construction will reflect challenging conditions.

By recording the energy use of two different families, results can show how personal preferences for thermostat settings and electric lighting affect home energy efficiencies. For example,

explained Rodenburg, the length of time family members leave doors and windows open can significantly affect total energy use. In addition to energy use, monitoring will measure temperatures and humidity inside and outside the home.

The human face of ultimate engineering design

“Habitat for Humanity Edmonton is a nonprofit organization working toward a world in which everyone has a safe and decent place to live,” said Alfred Nikolai, president and CEO of Habitat for Humanity Edmonton. “Innovative projects such as this NetZero home are imperative as we seek to provide sustainable and affordable home ownership to families in need.”

A most telling measure of the human value of the NetZero precast concrete home comes from one of the people who will live in the modernistic duplex. “My family is so grateful to everyone involved in making home ownership a reality for us,” said Tracy, Habitat partner and mother of four. “My husband and I will soon be building equity in this NetZero home and be able to save for our children’s future.” 

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

¹ NetZero means that the energy produced = the energy used.

² See more details about construction and panel design and a NetZero system diagram in *Precast Solutions*, Fall 2012, at precast.org/precast-magazines.



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Meadow Burke announces its new DT Connector

Meadow Burke, a manufacturer of reinforcing products, forming accessories, and road and bridge products based in Tampa, Fla., plans to revolutionize seismic resistant construction with its new DT Connector, says the company.

Limiting structural damage in large-scale buildings such as parking garages during seismic activity has always been a challenge for the precast construction industry. The new DT Connector is the first product of its kind designed

to reduce seismic damage in precast structures by improving the performance of chord connectors subject to seismic conditions, the company says.

Developed and tested at Lehigh University, the DT Connector raises the bar in seismic resistant construction by introducing a new type of ductile casted chord connector that provides a high deformation capacity. "Most connectors we tested fall into the low deformation category, and we saw the opportunity to develop a new type of connector with a higher flexural deformation capability to serve the diaphragm floor systems in high seismic zones," said Dr. Clay Naito, associate chair of the Department of Civil and Environmental Engineering at Lehigh University and who was instrumental in developing the DT Connector.

For more information, contact Meadow Burke at (877) 518-7665 or visit www.meadowburke.com.



MEADOW BURKE'S DT CONNECTOR

Hyster offers new lease program with Power Advantage

Hyster Co., a worldwide lift truck designer and manufacturer based in

Greenville, N.C., is giving lift truck users custom lease solutions with flexible end-of-term options and the ability to pay only for the hours used through its Power Advantage. The new leasing program bills for the actual hours of use during a given month, allowing customers to enjoy a "pay-per-hour"-based finance solution.

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Power Advantage is ideal for seasonal or mixed-use operations looking to pay for actual usage only, locking in a per-hour rate at the lease outset and avoiding overtime charges. These operations would typically use a lift truck between 1,200 and 3,000 hours per year.

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For more details on Power Advantage, visit www.hyster.com/Americas or contact a local Hyster lift truck dealer.

Precast Specialties Corp. welcomes new senior project manager

Precast Specialties Corp., a manufacturer of precast concrete panels and curbing based in Boston, announced that Brandon Duffel has accepted the position of senior project manager. His responsibilities will include managing and supporting projects for Precast Specialties Corp.'s rapidly growing Architectural Group.

Duffel, who earned a bachelor's degree in engineering from The Cooper Union, brings many years of experience and a proven track record as a project engineer

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and project manager to the company. Most recently, he was the engineering manager for Coreslab Structures.

For more information on Precast Specialties Corp., visit www.precastspecialtiescorp.com.

Sicoma/OMG and Sicoma North America acquire new facility

Sicoma/OMG and Sicoma North America Inc. have announced the acquisition of a new manufacturing facility located in the Clearwater Industrial Park in Clearwater, Fla.

Sicoma/OMG has provided concrete producers with engineered solutions for more than 65 years. Sicoma designs, engineers and manufactures high-performance, high-efficiency mixing equipment for concrete construction producers worldwide and has been operating in North America since 2005.

For more information, visit www.sicoma.biz.



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CPCA names new executive director

The California Precast Concrete Association, based in Rocklin, Calif., has named Cindy Miglino, CMP, CAE, as its new executive director. Carol Berry, the former executive director, retired effective Aug. 1.

CPCA was formed in 1990 to focus on the advancement of quality precast products in California.

Contact Miglino at (916) 259-2629 or CPCA@wavecable.com. For more information about the California Precast Concrete Association, visit www.caprecastconcrete.org.



CINDY MIGLINO



JIM POWELL

AWMA hires new executive director

The Air & Waste Management Association, a nonprofit, nonpartisan professional organization based in Pittsburgh, has named Jim Powell as its executive director. In his new role, Powell will work to grow and service membership, provide current and timely programming, and move the association forward into the next stage of its development.

Powell brings with him more than 37 years of technical and project management experience in the energy, environmental and consulting service industries. His areas of expertise include environmental engineering, air quality analysis, green house

gas determination, and carbon footprint measurement, energy management and facility siting. He has been a member of AWMA for more than 30 years and has held various leadership roles in the association.

Since 1994, Powell has been registered as a Qualified Environmental Professional by the Institute of Professional Environmental Practice. He holds a master's degree in environmental engineering from the University of Florida and a bachelor's degree with a concentration in general science and geography from the University of Iowa.

For more information, visit www.awma.org.

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We offer excellent salary and benefit packages.

Please email resumes to Dan McGhee at dmcghee@cpsprecast.com

NPCA CALENDAR

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

Meeting	Location	Date
The Precast Show 2013	Indiana Convention Center – Indianapolis	Jan. 11-13, 2013
NPCA 48th Annual Convention	The Homestead – Hot Springs, Va.	Oct. 9-12, 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.	March 5-7, 2015

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