March/April 2017
Vol. 30, No. 2

CONCRETE REPAIR BULLETIN

A Bimonthly Publication of the International Concrete Repair Institute

URBAN RECONSTRUCTION

2017 ICRI PRESIDENT BRIAN DALEY

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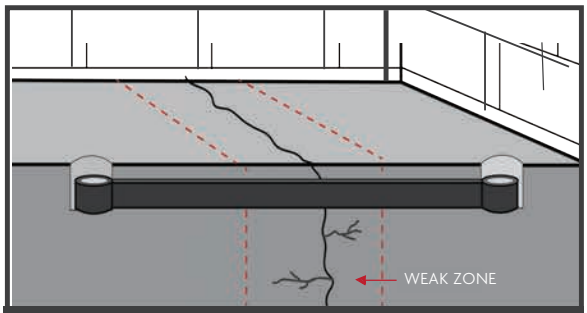

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CRB EDITORIAL DEADLINES

May/June 2017—March 1, 2017
Theme: *Building and Repair Code Updates*

July/August 2017—May 1, 2017
Theme: *Sport Facilities*

September/October 2017—July 3, 2017
Theme: *Bridges and Highways*

November/December 2017—September 1, 2017
Theme: *ICRI Project Awards*

INTERNATIONAL CONCRETE REPAIR INSTITUTE

ON THE COVER: 2017 ICRI President Brian Daley.

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NOTE FROM THE MANAGING EDITOR

With a theme of Urban Reconstruction, this month's Concrete Repair Bulletin features innovative ideas that will focus, not on the simple, but rather, the sustainable. As an ever-expanding and rapidly-changing industry veteran, we know you look to ICRI to showcase case studies, education and news that keeps you informed and inspired.

One facet of our organization that I'm often delighted to share is that our writers collaborate for the greater good of the industry. Simon Mainwaring once said, *"Since most corporate competitors have the same problems with sustainability and social reputation, it's worth trying to solve them together."* I'm proud that within our publication, we host some of the industry's greatest minds, connecting the dots to move the needle on innovation and change for all.

This time of year is busy for many in our industry, but we hope you take us with you. With upcoming conferences, trade shows and travel, take a copy of the CRB in your briefcase or bag and invite others to read online.

If an idea strikes you on a plane, or on the ground, please reach out. We'd love to feature your stories, insights and case studies. I believe wholly that collaboration is a key building block to sustainability- and we need voices like yours to help spread the word about ICRI and its many offerings.

Kate-Madonna Hindes
Managing Editor, CRB
editor@icri.org

Q&A WITH BRIAN DALEY

We recently sat down with ICRI President Brian Daley (also featured on the cover of this bimonthly issue of the *Concrete Repair Bulletin*) and asked him about his goals for the International Concrete Repair Association in 2017 and his insight into the organization.

BRIAN DALEY

Can you share with us your upcoming goals for ICRI?

I have four specific goals for 2017:

1. To continuing to grow ICRI's profile as the preeminent organization focused on repair of existing structures worldwide. That involves increasing memberships and sponsor participation.
2. To continue to expand and implement aspects of the ICRI Strategic Plan, such as ideas for new products and services submitted to the ICRI's secretariat and the promotion of certifications and other forms of education to better prepare existing workers and possible new pools of employment candidates. I want ICRI to help our members with tools, training and benefits so they can separate themselves from their competition.
3. To focus efforts on ICRI's outreach to and partnership with a variety of other industry organizations where there are synergies, such as with ACI, NACE, SWRI, and many others with which our members share common interests, so information sharing and collaborative efforts can add value to being a member of ICRI.
4. To improve communications between ICRI National and ICRI's chapters as well as communication among all the chapters, so information shared, activities and efforts at each local level are more consistent across chapters and so all members have the opportunity to contribute and make an impact on our industry.

What's ONE part of ICRI (or more than one!) that inspires you?

There are so many incredibly smart and accomplished people—the absolute giants of our industry—who participate in ICRI. I am always fascinated to listen to descriptions of challenges faced and successful solutions achieved on unique projects. So I am most inspired by the creativity and enthusiasm of our members.

What has been your biggest accomplishment to-date?

I think I would respond that it was being elected to the ICRI executive committee, and now assuming the role of president of ICRI. To be given support and respect from past officers, current board and executive committee members (featured on page 6), and other industry friends and associates, all people I think so highly of, means a tremendous amount to me, and signals a level of accomplishment of which I am very proud.

Finally, can you share with us, one thing you really think reflects positively on our organization?

ICRI's member retention rate is over 92%, which tells me that people and companies who join us feel like they benefit by the time and money they invest in participating.

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ICRI would like to thank all of our Supporting Members, whose dedication to ICRI is greatly appreciated. Their continued support has greatly enhanced programs both within ICRI and the concrete repair industry as a whole.

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ICRI Statement of Purpose

To improve the quality of concrete restoration, repair and protection, through education of, and communication among, the members and those who use their services.

The philosophy of the group is that if the quality of work is improved, and purchasers of repair services feel that they are obtaining a durable product, the demand for their products and services will increase and the image of the concrete repair industry will be elevated.

The founders also insisted that all classes and categories of membership be treated equally. Initially it was to have been a contractors organization, but the immediate interest of engineers, manufacturers, and others in its formation and success made it obvious that it should be open to all. Every attempt is made to ensure equitable representation, and the ICRI Board of Directors and all committees are made up of members from all disciplines and all geographical areas.

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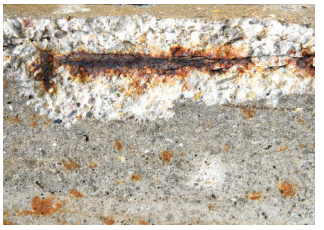


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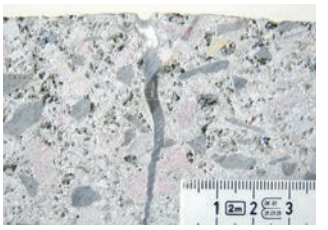

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A New Spin for PreSpun: An Innovative FRP Solution for Strengthening Concrete Cell Phone Towers

BY MO EHSANI AND MILAD MOGHADDAS

Fig. 1: Overview of the pole and the congested work space available at the base

The use of wireless communication has seen exponential growth in recent years. Not only is the number of customers relying on these services rapidly growing worldwide, but the amount of information being transmitted through these networks is also increasing. Whereas a decade ago mobile phones were used primarily for transmission of voice and text data, the trend has been towards use of images and video. These files are much larger in size, requiring faster networks to handle the heavier traffic.

The majority of telecommunication towers in the United States are steel latticed self-supporting/guyed structures or cantilevered poles, referred to as "monopoles" in the telecommunication tower industry. In denser urban environments, shorter prestressed concrete spun poles have been utilized. These poles were typically designed for a limited amount of appurtenances such as a single antenna array on a small mounting frame at the top of the concrete pole for the original client.

In order to keep up with the changing needs and increasing demands on their networks as the carriers migrate from 3G to 4G technologies and beyond, these wireless service providers may need to substitute or augment their existing antenna array. In order to do so, a structural analysis considering the proposed change is first performed on the existing tower to verify that the structure would have adequate capacity. Current code requirements tend to be more demanding than when the pole was originally designed. Additionally, the proposed antennae sizes and weights have increased over the years as technologies have evolved to better support the wireless service providers' customers. Because of these two factors, the pole may require structural upgrades to meet the higher demand from the proposed changes.

In parallel with this need for strengthening, there is a growing interest in the western states to seismically upgrade these towers. It is obvious that in the hours immediately following a large earthquake, cell phone communication is in high demand and the system must be designed to survive such an event. As an example, Los Angeles has recently introduced an ordinance requiring upgrading all cell phone towers to survive the pending "big" earthquake.

While retrofitting steel telecommunication towers is quite common and various options exist, such as upgrading the size of existing members and bolting or welding additional steel to the structure, there are limited options to strengthen precast concrete poles.

An alternative to these options is presented in this article. The proposed alternative is a cost-effective solution for structurally retrofitting an existing precast pre-tensioned concrete pole that can be installed without taking the wireless carrier's equipment off the air. Repairs can be completed within a reduced time frame compared to the other options and without significantly altering the overall appearance of the structure.

Case Study

A 55-ft (16.8 m) tall hollow precast concrete cell phone pole located in Los Angeles (Fig.1) was originally designed and constructed in 1996. The prestressed concrete spun-cast pole had a constant outside diameter of 15.75 in (400 mm) with a wall thickness of 2¼ in (57 mm). Reinforcing steel is comprised of 0.375 in (10 mm) diameter 250k (1112 kN) seven-wire strands. The structure is supported on a 36 in (914 mm) drilled pier foundation embedded 17 ft (5.2 m) deep.

Based on the code requirements at the time of design, prestressed concrete poles were typically designed for a single carrier level. Future proposed antennae additions coupled with code changes since the design can lead to the structure requiring additional capacity. Options for reinforcing these structures are limited and typically not cost feasible. The alternatives that were considered for this project are reviewed below.

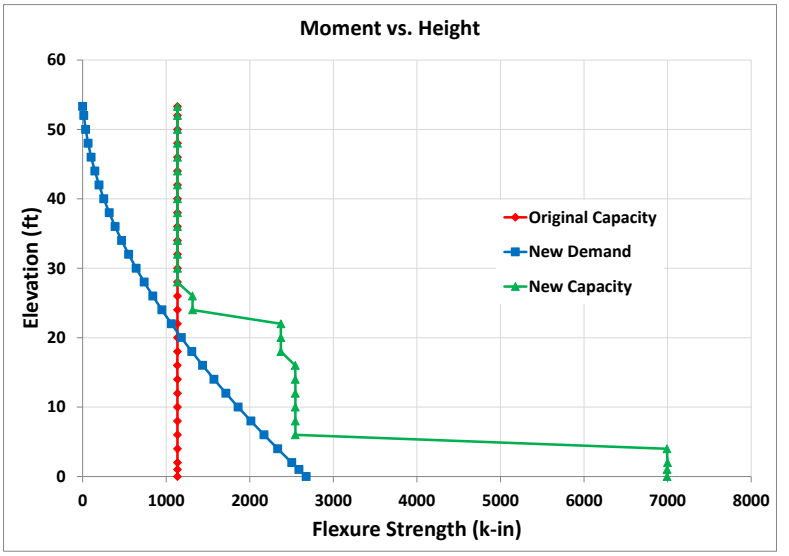

Fig. 2: Demand and capacity for the retrofitted pole along the height

The original capacity of the pole was 1135 kip-in and remains constant throughout the entire height of the pole (Fig. 2). The pole was analyzed for all dead and live load effects, including wind and earthquake. The controlling new demand shown in Fig. 2 resulted in the lower 22 ft (6.7 m) of the pole being overstressed by various degrees. As such, the strength of the pole needed to be enhanced by nearly 136% at the base.

One option used on past projects requires guying the structure that presents technical hurdles as well as practical considerations. The introduction of guy wires will most likely require the tower owner to incur additional costs purchasing or leasing additional ground space in the vicinity of the tower in order to expand the site foot print to place the new guy anchorage points. The guy wires would also require additional ongoing maintenance and inspections.

A second option has been to build a steel tower, including new foundations, around the existing structure. This option is typically quite expensive and may be prohibited by the local permitting jurisdiction due to significant changes to the aesthetics of the original structure.

In some cases, a third option to remove and replace the structure may be considered. However, this alternative is typically not preferred due to the logistics, the required permitting process, cost considerations and the disruption of service to the wireless providers. Complicating all of these options is that typically there is minimal space to work within the existing congested site compound with numerous obstructions.

The fourth option involved the use of Fiber Reinforced Polymer (FRP) that is described in more detail below.

FRP Alternative

Among the options considered, the use of FRP offered the most viable solution (Fig. 3). The technique offered the flexibility to readily change the strength of the pole along the height. A close examination of the stresses revealed that both compressive and tensile stresses in the pole exceeded the allowable limits under the new loads. FRP products have high tensile strength and can address the shortcomings of the pole easily. However, the compressive strength of FRP is significantly lower than its tensile strength. In most retrofit projects, it is not uncommon to ignore the compressive strength of the FRP. This meant that the thickness of the concrete wall of the pole had

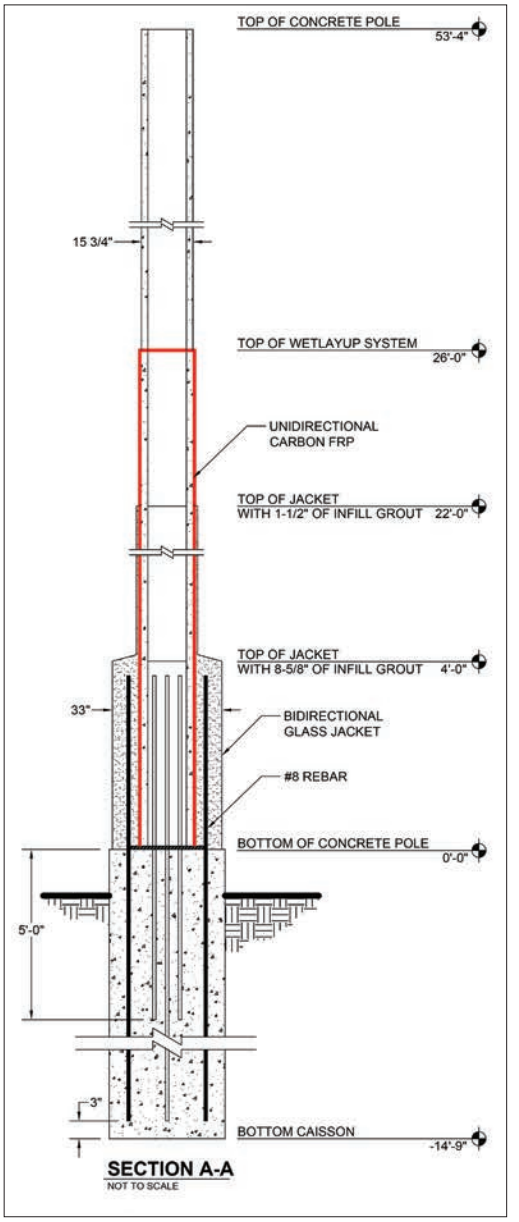

Fig. 3: Elevation of the pole for the retrofit scheme using FRP

to be increased by the addition of conventional concrete or grout to lower the compressive stresses below allowable limits.

Tension reinforcement for the pole was provided by bonding unidirectional carbon fabrics to the exterior surface of the pole. The carbon fabric used for this project was supplied in 24 in (610 mm) wide rolls and has a tensile strength of over 6 kips (27 kN) per 1 inch (25 mm) width of fabric. The fabric could also be cut into narrower bands for ease of installation without any adverse effect on its strength.

Fig. 4: Carbon and glass FRP applied to the lower 26 ft (7.9 m) of the pole

Fig. 5: FRP laminates used to create a shell around the pole

Based on the required strength, three (3) layers of carbon fabric saturated with epoxy were applied on the lower 16 ft (4.9 m) of the pole. Two (2) layers were sufficient for elevation 16 to 26 ft (4.9 to 7.9 m). Elevations above 26 ft (7.9 m) required no strengthening. For confinement and to eliminate any interference with the antennae signals, 2 ft (0.6 m) wide bands of a unidirectional glass fabric saturated with epoxy were wrapped in the hoop direction over all carbon fabric (Fig. 4) for elevations 0 to 26 ft (7.9 m).

As mentioned earlier, the 2¼ in (57 mm) thick wall of the pole was overstressed in compression. Therefore, the pole wall thickness had to be increased to meet the allowable compressive stresses. This increase in thickness can be different along the height of the pole, requiring a formwork or jacket whose diameter could be easily adjusted in the field. For this project, an increase in thickness of 1½ in (38 mm) for heights 0 to 22 ft (6.7 m) was sufficient. For elevations of 22 to 26 ft (6.7 to 7.9 m), no increase in thickness was required and only FRP fabric was sufficient for increased tensile strength.

A special FRP laminate offered an economical solution for this application. The laminates are manufactured in the plant by saturating rolls of fabric with resin and running them through a special press that applies heat and pressure, resulting in 4 ft (1.2 m) wide rolls with a thickness as little as 0.01 in (0.25 mm). The relatively large width and small thickness of the laminates makes their manufacturing unique and challenging. The thin laminates (Fig. 5) are flexible and could be readily wrapped around the pole in the field to create a stay-in-place form that can be filled with grout or resin. The properties of the laminates are listed in Table 1. Depending on their composition, the laminates offer reinforcement in one or two directions.

Table 1: Material Properties of FRP Laminate

	Unidirectional Carbon	Biaxial Carbon	Biaxial Glass I	Biaxial Glass II
Thickness, in (mm)	0.026 (0.66)	0.026 (0.66)	0.026 (0.66)	0.010 (0.25)
Longitudinal Direction:				
Tensile Strength, ksi	156	101	62	49
Tensile Modulus, ksi	13,800	7,150	3,500	3,200
Transverse Direction:				
Tensile Strength, ksi	9	64	60	49
Tensile Modulus, ksi	1,190	2,940	3,650	3,200

For this project, the biaxial glass laminate with a thickness of 0.026 in (0.66 mm) was used. For the region covering the height of 4 to 22 ft (1.2 to 6.7 m), these laminates were coated with an epoxy paste and wrapped around the pole to create a two-ply shell. At this stage, the shell is not bonded to the pole and it is free to be moved up and down. Temporary 1½ in (38 mm) thick spacers, such as a PVC pipe, were attached to the pole surface to facilitate the wrapping of the laminates with the necessary annular space. The structural shell created in this fashion provides the equivalent of No. 4 Grade 40 ties at a spacing of 2½ in (64 mm) along the pole. The shell also offers a tensile resistance similar to No. 4 Grade 40 steel reinforcing bars distributed at 2½ in (64 mm) spacing around the pole. For this project, these contributions were conservatively ignored. The selection of glass over carbon laminates was based on the electrical insulation properties of the former.

Near the base of the pole, the moments had to be transferred into the footing. Since the carbon FRP is terminated at this location, steel reinforcement was used to achieve this objective. The FRP fabric in that region

Fig. 6: Reinforcement detail near the base showing the anchored steel, FRP laminate shell, and the finished installation

was coated with a layer of sand for improved bond and to transfer stresses. Twelve No. 8 Grade 60 bars each 14 ft (4.3 m) long were epoxy anchored into the existing foundation. These bars extended 4 ft (1.2 m) above grade (Fig. 6). Even though a 4 in (102 mm) annular space was sufficient, the existing square steel base plates required the shell to have a diameter of 25.75 in (654 mm) at the base. As can be seen in Fig. 2, this resulted in a very conservative over design near the base of the pole. The completed repair of the base region was just wide enough to fit in the available space between the existing cables and the fence wall (Fig. 6).

Field Installation

The strengthening solution presented above took approximately four days to be completed. The lightweight laminates eliminated the need for heavy equipment and all work was accomplished using a manlift (Fig. 1) or scaffolding (Fig. 7). Once the shells were created around the pole, the annular space was filled with a high-strength non-shrink grout. The laminates were coated with a UV-resistant coating. Many cables and appurtenances that were near or attached to the pole were moved slightly to accommodate the FRP and concrete placement, and were then relocated to their original position (Fig. 6). The design allowed the pole to remain fully operational during the repair with little change in the appearance and size of the pole.

Fig. 7: Retrofitted pole prior to the application of paint and removal of the scaffolding

Fifty-two (52) monopoles have been retrofitted with this technique in 2015 and 2016. Additional structures have been scheduled for retrofit in the greater Los Angeles basin and elsewhere for 2017 based on cell phone coverage needs.

***Mo Ehsani**, PhD, PE, SE, FACI is President of QuakeWrap, Inc. and Centennial Professor Emeritus of Civil Engineering at the University of Arizona. He has pioneered the field of repair and retrofit of structures with FRP since the late 1980s and has developed a number of unique products for such applications. One of these products that is made with sandwich FRP construction technique received the 2016 ASCE Innovation Award as the world's first green and sustainable pipe. Ehsani is a member of ICRI Committee 330 Strengthening and Stabilization.*

***Milad Moghaddas**, M.Eng, EIT, is a quality assurance engineer for FRP Construction, LLC. He holds Masters Degrees in Structural Engineering and Construction Management. He has a strong technical background in concrete repair and protection with Fiber Reinforced Polymer, and serves as the quality control lead for structural retrofit projects.*

Pneumatically Applied Concrete Repairs

BY JOSEPH RIZZO

American politicians across and even within the aisles found little common ground this election cycle. There is one issue, however, where there was little argument. The physical common ground that we stand on is in severe need of repair. "Crumbling infrastructure" has become a rallying cry at all levels of government and promises of funding to fix it abound. The private sector also has a healthy appetite for repair: a growing urban population is not only increasing the need for new structures, but producing a demand for renovated, reconstructed and repaired structures.

Fig. 1: Large continuous vertical repair areas are particularly suited for PACM

Fig. 2: Multiple areas repaired using PACM

Urban areas require reconstruction and the repair community has many choices in materials and application methods. Yesterday's innovative cutting edge has become today's refined tradition. Currently, evolving repair technology is simultaneously new and based on proven principles. One such method, the pneumatic application of concretes and mortars, is being proven as reliable and cost effective for any size and configuration of repairs in building and transportation applications.

Pneumatically applied concrete or mortar (PACM) is a process by where compressed air is used to propel the material from a nozzle at a velocity and pressure that is sufficient to adhere to a substrate on impact. This method is ideal for repairing vertical and overhead surfaces of almost any thickness. The expelled concrete or mortar must have a low slump so that it stays in place without the use of formwork. This makes PACM particularly attractive for repairing large continuous areas (Fig. 1) or numerous smaller areas (Fig. 2). The low slump, achieved by a low water/cementitious materials ratio, ensures a strong, durable repair material. Once placed, the repair material can be screeded to the desired level and shape. Any finish can be achieved, or the material can be left as is in what is known as a gun finish.

PACM can be used to structurally repair, strengthen, and protect a structure. Typical infrastructure repair applications include tunnels (Fig. 3), bridges, and the undersides of highways. Industrial and commercial uses include tanks, seawalls, retaining walls, parking garages (Fig. 4), overhead beams, large columns (Fig. 5) and general spall repair in buildings. The method is a viable alternative to using overhead or vertical forms or manual

placement by troweling and is often quicker and more efficient.

Some basic clarification of the words "concrete" and "mortar" will help avoid confusion. The terms, as used here, refer to the most basic definitions of these materials. Concrete contains cement, fine aggregate (usually sand), coarse aggregate (usually stone, or gravel), and admixtures for enhancing performance. Mortar contains cement, fine aggregate and admixtures, but no coarse aggregate. Both are mixed with water to hydrate the cement in a quantity that facilitates placement. Nothing is implied about intended use, such as associating mortar with masonry. Also no implication is made regarding how the material is supplied, so concrete can refer to a prepackaged product, a field mix, or ready-mix.

Pneumatic Application: Shotcrete vs. Wet Spray Mortar

There are two predominant methods where concrete or mortar can be pneumatically applied. Shotcrete can be used for either concrete or mortar, while wet spray is a technique for placing fine aggregate mortar. The terms are often used as nouns to describe the material that is being applied as well as verbs denoting the process itself (Historical note: The term gunite is still in limited use and has specific connotations in certain industries. However, it is originally proprietary and has been largely replaced by shotcrete as the accepted nomenclature).

Shotcrete and wet spray are similar in that pressurized air is used to propel and apply the material. They are, however, distinctly different methods that use equipment and materials specific to each.

Shotcrete, often associated as a method for applying concrete in swimming pools and new construction, is gaining popularity as a repair method. Wet spray, that came later as an offshoot of shotcrete, is almost entirely exclusive to the repair industry and was developed predominantly for smaller applications such as spall repair areas that are too large to trowel and too unwieldly to form.

Shotcrete is defined in standards and procedures and by an industry association, whereas wet spray is a term that has come into use less formally by general acceptance. Shotcrete and wet spray mortar are differentiated by the velocity the material is projected from the hose onto the substrate. Although there are other characteristics that are

Fig. 3: Tunnel damaged by Hurricane Sandy ready to receive 8 in (203 mm) structural lining for repair and strengthening

Fig. 4: Overhead repair in parking garage to receive dry process shotcrete

Fig. 5: Repair areas ready to receive shotcrete at column

Fig. 6: Dry process shotcrete application

associated with each process, such as size and type of equipment as well as intended application, these are typical rather than absolute differentiations. Particle velocity and the resulting force of impact are the true distinguishing criteria. In ACI 506R[1] "Guide to Shotcrete," both the dry-mix and wet-mix process guidelines stipulate that the materials are "jetted from the nozzle at high velocity onto the surface to be shotcreted." The document specifically excludes what is termed as "low pressure, low velocity wet-process mortar" from being considered shotcrete and places it outside its scope.

Shotcrete: Dry and Wet Processes

Shotcrete application is further divided into dry or wet processes. It must be emphasized that wet process shotcrete is not the same as application by wet spray. It is easy to see why the similarity of expressions could be a point of confusion. The terms "shot" vs. "sprayed" describe the action of applying shotcrete vs. wet spray, respectively. Though not a technical differentiation, each term is intuitively associated with a certain force of propulsion.

Either wet or dry, shotcrete is a high velocity process that propels (shoots) the concrete or mortar from a nozzle, resulting in a high pressure impact with the substrate. Particle velocities in excess of 100 ft/sec (30 m/sec) are not uncommon. The force of impact accomplishes a number of benefits including penetration around reinforcing bar or mesh and compaction of the material. An added benefit is that the high velocity and coarseness of the aggregates actually abrade the substrate in a fashion similar to sand blasting. This effectively increases the roughness and improves the profile of the substrate while the material is shot. The resulting placement is densely packed and well bonded to the substrate.

Wet and dry refer to the state of the concrete as it is conveyed through the hose to the nozzle. Dry process uses pressurized air to move the material in a dry, or slightly dampened state from the equipment to the nozzle (Fig. 6). The nozzle itself is a specialized piece of equipment that introduces and combines water with the air-driven dry components, resulting in a product that is mixed a very short time before it hits the substrate. A huge advantage of this method is that material can be conveyed a long way without losing its working time or consistency since the hydration of cement does not begin until the material reaches the nozzle.

Additionally, the water/cementitious materials ratio can be kept extremely low since there is no need for water of convenience, only water of hydration.

Dry process shotcrete machines are single purpose specialty pieces of equipment that are not used in other concrete placement methods (Fig. 7). Additional concrete pump or mixer is not required. Lower volume machines have been developed specifically for repair and specialty applications. The nozzleman is responsible for both the flow of air and water, and controlling the consistency of the mix. Wet process, as you have probably guessed, refers to the state of the concrete or mortar as it is being conveyed. In this process, the material is mixed in a mechanical mixer on site, or delivered by ready-mix truck and pumped using a piston driven concrete pump (Fig. 8). The nozzle is much simpler since it is not a mixing device. Compressed air that is introduced at the nozzle is only used to accelerate and shoot the concrete (Fig. 9). Advantages of this process are extremely high production rates, and less dusting and rebound, making it more suitable for confined applications and sometimes cost. The disadvantages of the wet process are a finite working time and possible clogging of pumping equipment.

Both wet and dry process shotcretes are available as prepackaged materials. This can be advantageous when a performance or prescription specification has to be met. Some typical admixtures in prepackaged materials include:

Silica Fume–increases density and lowers porosity.

Fiber–crack resistance.

Accelerator – faster strength gain for quicker turnaround or cold weather placement. Also assists in overhead placement since the material can be built up more quickly.

Plasticizer – increases slump at a lower water/cementitious materials ratio to facilitate pumping in wet process.

Polymer – increases flexural and tensile capabilities.

Specialty cements – refractory repairs, very quick turnarounds.

Lightweight aggregate – reduces dead load.

The compressed air requirement for shotcrete is 300 to 1000 ft^3/min (8.5 to 28 m^3/min) and is provided by external large portable compressors. The application rate can be up to 12 cy (9 m^3) per hour

Fig. 7: Dry process shotcrete rig: compact, yet capable of significant application rates

Fig. 8: Ready-mix shotcrete used for wet process application

Fig. 9: Wet process shotcrete application

Fig. 10: Small wet spray machine, larger models available

for dry process and upwards of 50 cy (38 m^3) per hour for the wet process. Thickness of application can be from 2 in (51 mm) to 1 ft (0.3 m). The American Concrete Institute (ACI) provides nozzleman certification for both the dry and wet processes at www.concrete.org/certification/certificationprograms.aspx.

ACI 506R thoroughly describes the requirements for materials, processes and personnel. It provides material standards for both field mix and prepackaged products. The equipment requirement section contains information on dry and wet process rigs, compressed air, nozzles and hoses. It covers proper execution from surface preparation through curing and protection of the placement. ACI 506R also makes recommendations for crew composition and sets guidelines for crew experience and qualifications.

Wet Spray Mortar

Wet spray mortars are specialty prepackaged mortars that were developed for repair applications. These products were formulated to be used by repair and restoration contractors as an efficient alternative to manually applying larger vertical and overhead repairs. They are made with a fine sand and many can be trowel applied as well as sprayed, increasing their usefulness in the arsenal of the repair contractor.

Wet spray does not require dedicated certified personnel to operate the equipment. The equipment used for spraying is usually much smaller than shotcrete machines and is self-contained (Fig. 10). The entire apparatus including mixer, pump and onboard compressor can be a unit that is no larger than 2 ft (0.6 m) in any dimension although larger equipment is available. The pump is a rotor stator machine, usually capable of only pumping fine aggregate mortars, while the air compressors are rated at only a few cubic feet per minute (cfm).

Application rates are typically 0.5 to 1 cy (0.4 to 0.8 m^3) per hour. Since spraying velocity is significantly less than shotcrete, wet spray cannot develop the compaction or abrasion associated with the shotcrete method. That being the case, wet spray mortars utilize specialized admixtures and cements to develop high bond, high strength and durability.

The advantages of wet spray mortar are ease of use, accessibility and capability to repair the smallest repair areas with minimal rebound (Fig. 11). Wet spray equipment can also be used to apply cementi-

tious coatings for aesthetics. As shotcrete equipment has been developed to handle smaller repairs, larger wet spray equipment is now available for bigger projects. It should be noted that the fine aggregate used in wet spray mortars can limit the ultimate thickness where they are placed, or require placement in lifts. Consulting the manufacturer of the specific material is the best way to determine its capabilities.

Ultimately, the use of PACM and whether to use shotcrete or wet spray mortar come down to convenience, access to equipment and personnel, and size of project and individual repair areas. If they have a strong preference, specifiers should be particularly clear about the method to be used as properly placed PACM will result in long lasting, cost effective and highly durable repairs.

Fig. 11: Wet spray propels material at much lower velocity than shotcrete

References

1. ACI Committee 506, "Guide to Shotcrete (ACI 506R-16)," American Concrete Institute, Farmington Hills, MI, 2016, 52 pp.

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Salvage: A Sustainable Alternative When Restoration is Not an Option

BY JEFFREY KOBES AND JACOB BICE

Taking a building that is distressed and not functioning well and returning it to a functioning part of the building stock is both challenging, rewarding, and sustainable. However, there are situations where existing buildings cannot be restored for a variety of reasons, including advanced deterioration, cost for renovation, and the existing building's incompatibility with the required program. In those cases, salvage may be a viable option. While salvaging selected items clearly does not retain the embodied energy of the whole building, it prevents important items from going to the landfill and can create a link between the old building and the new construction.

Fig. 1: Brick and cast stone capitals and spandrels that were salvaged and reinstalled as an interior architectural feature in the new construction

One such project where salvage became part of the program was the redevelopment of approximately three-quarters of a city block in downtown Oklahoma City, Oklahoma. This development was the first multi-tenant office development in this downtown in 30 years. To accommodate space for the development, nine buildings that represented the last remnants of downtown Oklahoma City's old retail Main Street were set to be demolished to accommodate a new 27-story tower and two mixed-use parking structures.

After evaluation of the existing buildings, it was found that the state of deterioration and the program demands of the proposed development prevented the existing structures from being a viable part of the new development. However, it also became apparent that some in the community were interested in saving the buildings as various grass roots organizations organized to help protect the buildings. After discussions between the developer, the interested people in the community, and the historic commission, it was determined that the developer would demolish the buildings but salvage several iconic features and re-integrate those features into the new development.

Therefore, it was important that the salvage and re-installation of the historic elements be performed successfully to accomplish the overall project objectives. To achieve this goal, three key principles were incorporated into the project work flow: thorough investigation, good communication, and execution planning.

Thorough Investigation

The starting point for any salvage project is investigation. Without a thorough and focused investigation, any resulting problems can potentially derail a salvage project. Taking time to answer four questions helps keep the project on track:

What should be salvaged?

How much can be salvaged?

What is the condition of the salvaged material?

How can it be removed?

To answer the first question, cataloging was performed at the site. This meant performing close-up observations of the historic features and making an initial determination of what could feasibly be retained. The documentation was then distilled into a list with photographs that were discussed with the stakeholders. In this case, the

stakeholders were a combination of the owner, developer, architect, and the local Historic Preservation Commission. The Historic Preservation Commission was able to provide insight into what features were important to the original Main Street area. Using this information, the architect and owner were able to determine how the integration of the salvaged items would impact the proposed design and the intended budget. The final list of salvage items was then added to the project scope and included:

- The polychromatic terra cotta frieze on a mid-century department store;
- The cast stone frieze from a 1940s era Art Deco hotel;
- The brick and cast stone capitals from a 1940s era Art Deco parking garage (Fig. 1);
- The vitrolite glass panels from a mid-century bus station that gave that building its iconic color and finish; and
- A neon-lighted, mid-century "Lunch Box Sandwich" restaurant sign.

Once it was determined what should be retained, it was critical for the architect to understand how much of each of the selected elements could be salvaged. As part of the investigation, the sizes of the elements to be retained and the quantity of each unique item were recorded (Fig. 2). Quantities and dimensions were provided to the architect for development of a realistic integration strategy.

In addition to the quantity and sizes of the units, the design team also needed to understand the condition of the elements being retained. For example, the cast stone frieze elements only required cleaning to maintain their historic appearance. However, the terra cotta had varying degrees of distress and damage that needed to be repaired. Discussions with the architect about the final appearance of repairs and the acceptable size of unrepaired areas were important to establish a baseline level of repair.

Once the scope of the intended salvage and the conditions of the elements being preserved had been determined by the team, it was necessary to ascertain how to properly remove each of the items to be salvaged (Fig. 3). The contractor needed to know what means and methods would be appropriate so that accurate bids could be submitted and change orders could be minimized. The design team also needed to understand if there would be significant reductions in the quantities of salvaged materials due to damage that could occur during removal. For this project, isolated removal and exploratory openings were made with the assistance of an experienced restoration contractor to help the team confirm the best practices for removal and to estimate the possible loss of materials during removal.

Fig. 2: Measurements of the polychromatic terra cotta units and total quantities were made to determine the available quantity for the reinstallation

Fig. 3: Selective removal and exploratory openings during the investigation were used to determine the type of connection of the terra cotta to the back-up wall

As a result of the investigation, it was determined that the brick and cast stone capitals were simply stacked with little to no connection between the units, and the cast stone frieze elements were laid in the masonry with no significant ties that needed to be cut. Removal of these items was anticipated to be straightforward with no projected loss of materials.

In contrast, for the terra cotta frieze, it was critical to locate the quantity of anchors, determine the strength of the bedding and fill mortar, and identify the units that could be sacrificed to achieve access. During the investigation, it was found that the mortar fill behind the terra cotta was actually concrete and that two heavy ties per unit were embedded into the concrete and the back-up wall. It was also discovered that the frieze was seated

into the web of a beam header that would further complicate removal. In this case, since the frieze units were the only ones to be salvaged, the ashlar units above the frieze were sacrificed to provide adequate access for removal.

Good Communication

The second key to a successful salvage project is good, clear communication, and begins with communicating the findings of the investigation to the rest of the design team. For example, the architect needed to know the size and layout of the brick and cast stone capitals. These capitals were large and not easily accessible so only approximate measurements were made. During the investigation, these important measurements were communicated to the Architect for inclusion into the final design (Fig. 4). During the investigation, it was also observed that the side panels were not constructed symmetric to the capital. This was communicated to the architect, who made a decision as to whether the panels would be reinstalled symmetrically for aesthetics or asymmetrically to reference the historic construction. Identifying and communicating this observation was critical because it would not only impact the final design, but would also be important in determining what would be removed to achieve the desired final outcome.

Fig. 4: Measurements were made of the brick and cast stone capitals

Communication with the contractor was also extremely important for the successful delivery of the project. This communication began with accurately identifying the items to be salvaged on the construction documents. Utilizing rectified photographs of the elevations, specific units to be salvaged were called out to clearly identify what was to be removed.

The communication with the contractor continued as demolition began, starting with pre-demolition meetings that also included the subcontractors performing the work. During the pre-demolition meeting, specific areas were pointed out where there might be potential instabilities, such as the masonry supported on the cast stone frieze that would need to be shored after removal of the frieze and would need to remain in-place until the buildings were fully demolished.

Communication from beginning to end, involving both the design team and the contractor, was a fundamental factor in making the project a success.

Execution Planning

The final key principle is execution planning. Even with the most thorough investigation and the best communication with stakeholders, an execution phase that is well planned must be implemented to deliver the project efficiently. Looking ahead and planning the execution through a series of critical project decisions related to the salvage is essential.

There are several decisions that can be made during the execution phase that will help the project end in a success. One decision to be made early in the process is determining who will perform the salvage, storage, repairs, and reinstallation of the selected items. On this project, it was determined by the general contractor that the same subcontractor would perform all four scopes of work. This decision was beneficial because it helped ensure that there were no lapses in the contract between multiple parties. Additionally, the subcontractor had a vested interest to perform each part well, because their efficiency and end result would be directly related to the quality of their own work early in the process.

Another decision concerned whether or not to take additional material where possible. As in most salvage projects, there was only one opportunity to get the original materials from the building. After the building is demolished, the original materials could no longer be obtained. It was decided that the salvage contractor should take additional materials where possible, so that if a piece is damaged during transport or is discovered to be missing, it is possible to utilize the additional original material to replace the lost piece. This decision proved helpful with the brick and cast stone capitals. While only three were reinstalled, the subcontractor actually took four capitals and much more brick than was needed. When it was discovered that several finial pieces were missing, three complete sets were created from the four capitals salvaged. For one particular piece found to be missing, it was determined that a similar piece from a corner capital could be cut down and used for the missing piece. The decision to take additional materials saved the time and expense of trying to replicate the missing units and the inevitable variation between the replicas and the originals.

Another decision that aided execution was to make frequent visits to the site during salvage, especially early in the removal process. Observations early in the process provided the subcontractor a chance to ask questions and allowed for alterations to the removal strategy to reduce damage to the salvage items (Fig. 5).

Once the items had been salvaged, it was important to update quantities. By making a close inspection of the salvaged units after removal, a final quantity of the units and the repairs could be determined. Even at this stage, if the quantity ended up being less than initially calculated, there would still be time to holistically address the discrepancy in the design without disrupting the construction schedule and budget.

A decision also had to be made regarding the required mock-ups. For this project, mock-ups with the terra cotta were especially important. There were significant amounts of repair required to bring these units into an acceptable condition, and mock-ups helped define an acceptable repair process and develop consensus among the design team on what the finished product would be. Full scale mock-ups were also important. The final location of the terra cotta pieces was in a glass fiber reinforced concrete (GFRC) panel set onto the new building. By installing the pieces in a full scale mock-up panel, it was possible for everyone to observe the historic unit from the actual distance and gain comfort in seeing the historic units in a new panel (Fig. 6).

Conclusion

Currently, the final salvaged pieces are being installed on the project. Even though the existing buildings could not be restored, the successful focus on thorough investigation, good communication, and execution planning has allowed the new buildings to retain a piece of the past.

Fig. 5: Frequent visits to the site allowed for opportunities to observe and provide alternate strategy for removal of the terra cotta

Fig. 6: Full scale mock-up of the terra cotta frieze installed into the GFRC panel (note that the end pieces were recreated units being reviewed for acceptance in the final installation)

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Members Enjoy "A Room With A View" at the 2017 Kick-Off Party

BY DALE REGNIER

ICRI chose a new location—the Voodoo Lounge on the 51st floor of the Rio Hotel in Las Vegas—for our 11th Annual Kick-Off Party. Held in conjunction with World of Concrete, this annual event provides members the opportunity to have a little fun and relax as they celebrate the coming year. More than 250 people enjoyed the view overlooking the entire Las Vegas Strip from the private terrace.

The evening included a full buffet dinner, an open bar, and an opportunity to mix and mingle with ICRI members, association leader and staff. While food and drink were readily available, a number of guests ventured out onto the windy and chilly terrace to take in the unique view of the entire Las Vegas Strip—a view that can only be seen from the top of the Rio Hotel.

Events like this one would not be possible if it were not for the dedicated support of our event sponsors. ICRI would like to extend a very special thank you to all of our generous party sponsors.

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Website: www.swrionline.org

MARCH 15-17, 2017
2017 ICRI Spring Convention
Theme: *Bridges and Highways*
Le Westin Montreal
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Website: **www.icri.org**

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Events can be emailed to editor@icri.org. Editorial content for the July/Aug issue is due by May 1, 2017 and content for the Sept/Oct issue is due by July 3, 2017.

Award-winning concrete restoration solutions - MPC Park Deck

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Learn how a five-story 240,000 square foot parking garage, that was set for demolition, ended up winning the prestigious Award of Excellence from the International Concrete Repair Institute (ICRI).

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ASC & CHEMQUEST JOINTLY ANNOUNCE THE RELEASE OF THE 2015-2019 WATER BASED ADHESIVES IN NA MARKET REPORT

The ChemQuest Group, Inc., a leading business strategy firm in specialty chemicals, and the Adhesive and Sealant Council (ASC), jointly announce that the 2015-2019 Water Based Adhesives in North America Market Report is now available for purchase through the ASC.

The report focuses on primary interviews among key industry stakeholders including end users and influencers in the following sub-segments, entities and channels:

Assembly
- HVAC
- Metal Panel Manufacturers
- Flexible Materials

Transportation
- Car & Truck
- RV
- Bus
- Rail

Woodworking
- Furniture
- Window & Door
- Associations
- Distributors

Packaging
- Case & Carton
- Flexible Packaging
- Paper Converting
- Adhesives Manufacturers

"This report prepared by the ChemQuest Group, Inc. provides adhesive stakeholders with key trends, market drivers and value chain requirements for the Transportation, Woodworking, Assembly, Building and Construction and Packaging markets for adhesives. ChemQuest analyzed the report's market findings based on dozens of interviews they conducted within the value chain, with a special focus on unmet needs, policy and regulation change as well as competing technologies and key decisions that are driving material selection for end users." says Steve Duren, ASC Senior Director.

"ChemQuest's role in uncovering market drivers such as user requirements, policies and unmet needs by sub-segment that can be met with the properties of waterborne adhesive technology (to add value to end products) will inform industry stakeholder's business strategies through 2019." according to Dan Murad, president/CEO of ChemQuest.

In mid-2016, the ChemQuest Group, Inc. also prepared ASC's 2015-2019 Hot Melt Adhesives in North America Market Report using the same methodology, report sections and format.

Both ASC market reports (Waterborne Adhesives and Hot Melt Adhesives) can be purchased at the ASC Store or by contacting Steve Duren at ASC by e-mail at steve.duren@ascouncil.org or by phone at (952-300-8280).

MAPEI HIGHLIGHTS 80TH ANNIVERSARY WITH CONTRACTOR CONTEST

MAPEI Group, a leading manufacturer of mortars, grouts and chemical additives for the construction industry, is celebrating 80 successful years in business in 2017. From its beginnings in Italy to its global presence today, the company has become an icon for the development of technologically advanced systems and transparent manufacturing processes.

MAPEI Americas is highlighting this anniversary with a fun-themed contest for the contractors who use MAPEI products. Supporting the slogan "Celebrate our past – Enjoy our presents," MAPEI is inviting contractors to make use of their purchases during 2017 to enter the MAPEI 80th Anniversary Giveaway. Contractors can go to a landing page on MAPEI's Website (www.mapei.com) and process documentation for one entry per each $100 of products purchased. The contest runs from January 10 through December 14, 2017. Detailed contest rules are located on the website as well.

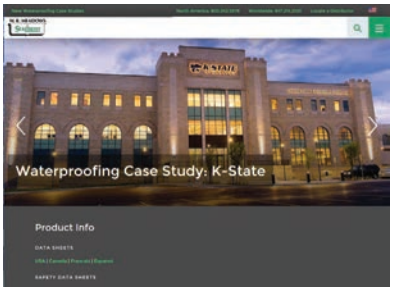
Six winners will be selected in a random drawing that will be held on January 4, 2018. The grand prize is an Arctic Cat Wildcat X recreational off-highway vehicle with side-by-side seating. The first-prize winner will have a choice of an Arctic Cat Alterra 700 ATV or an Arctic Cat ZR 6000 Sno Pro ES snowmobile. The second runner-up will receive a Colnago V1-R road bike. Three third runner-ups will be presented with a DJI Phantom 4 Quadcopter drone with camera.

"After 80 years, MAPEI is stronger than ever as the world leader of materials for construction and flooring. The contractors' support is our greatest reward, and we're celebrating our high-tech legacy by giving high-tech gifts to them," said Steven Day, Operational Marketing Manager for MAPEI Americas.

W. R. MEADOWS WEBSITE– REVAMPED AND RELAUNCHED

W. R. MEADOWS is proud to announce the launch of its new website. Many changes have been implemented, including the basic feel and navigation of the website. The website has been redesigned to give it a more contemporary feel, including a more immersive front page, easier navigation to product information, and an enhanced layout. A key improvement of the website is its

enhanced mobile-friendly features. The site automatically adjusts based on the width of browser or size of mobile device. The site looks sharp regardless of device – from the largest monitor to the smallest smart phone. With all these innovations, W. R. MEADOWS hopes that the new website is the premier construction website for those in the architecture, design, and construction community.



All the incredible content over the years is still available, including access to product data sheets, safety data sheets, project profiles, and more. The W. R. MEADOWS website contains a vast amount of information, and is the perfect stop for anyone looking for detailed product information, or anyone looking to see what products are included in the W. R. MEADOWS line.

W. R. MEADOWS, a building materials manufacturer, delivers one of the broadest lines of premium-grade construction products available to architects, engineers, contractors and building owners, which meet a multitude of construction application needs. From highway construction and repair, building construction and restoration, to waterproofing/vaporproofing/air barrier products and more, W. R. MEADOWS been satisfying the needs of the public and private sector of the building construction industry since 1926.For more information, call (800) 342-5976, e-mail info@wrmeadows.com, or visit www.wrmeadows.com.

CINTEC NORTH AMERICA ANNOUNCES 25TH ANNIVERSARY

Celebrating years of the world's best reinforcement and anchoring systems

CINTEC North America, a world leader in the field of structural masonry retrofit strengthening, repair, and preservation, announces its 25th anniversary. Since it began, CINTEC has grown to be a global company, providing systems and services through locations in the UK, Canada, America, Australia, and India.

As a representation of their accomplishments, CINTEC received the 2016 Construction and Engineering Award for Innovation in Engineering, Research and Development. "CINTEC is proud to receive this award and will do everything in our power to ensure our production and service remains worthy of this high standard," said Robert Lloyd-Rees, C.O.O. of CINTEC North America. "We are excited

to begin our 25th year supplying quality anchoring and strengthening systems."

Starting when Robert Lloyd-Rees visited America in 1990, CINTEC has made it a point to expand their dedicated service to North America. In 1992, Robert was appointed the C.O.O. of CINTEC and has been running thriving corporate offices ever since.

CINTEC's independent but collaborative engineering, design and consulting companies form a unique global presence together with partnerships and agents throughout the world. Its product range includes divisions such as Archtec and Blastec that offer clients turn-key engineering service packages, including design, engineering, and installation contracting.

For more information on CINTEC, visit: http://cintec.com/.

THE QUIKRETE® COMPANIES AWARDED SPIRIT OF LIFE BY CITY OF HOPE

City of Hope recently named the QUIKRETE® Companies, the leading manufacturer of packaged concrete products for the building and home improvement markets, its 2017 Spirit of Life honoree. The QUIKRETE® Companies proudly joins a list of past Spirit of Life award winners from the hardware and homebuilding industry recognized by City of Hope for an unwavering commitment in the fight against cancer, diabetes and other life-threatening illnesses.

Based in Southern California and one of the country's foremost research and patient care institutions, City of Hope presents the Spirit of Life award annually to celebrate humanitarian contributions and accomplishments that help elevate the human condition. Honored at a reception last month during the International Builders' Show, the QUIKRETE® Companies was not only humbled by the recognition, but reaffirmed its commitment to champion City of Hope on behalf of the hardware and homebuilding industry, which has raised more than $150 million in the past 35 years.

"City of Hope is not just a hospital in California, it's a world-class institution fighting and treating diseases," said Kevin Courtney, associate vice president of corporate philanthropy for City of Hope. "QUIKRETE has been dedicated to supporting City of Hope for more than three decades and we hope their example will lead others in hardware and homebuilding industry to join in the fight to one day cure these deadly diseases."

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your industry news to editor@icri.org. Editorial content for the July/Aug issue is due by May 1, 2017 and content for the Sept/Oct issue is due by July 3, 2017.

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Guardian of the Structure

W. R. MEADOWS
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Restore and protect concrete structures with W. R. MEADOWS.

From W.R. MEADOWS you get it all: repair mortars designed for host substrate compatibility to assure long, effective repairs. Mortars that minimize shrinkage and eventual cracking to keep rebar protected from salt and water. Mortars that can meet any application requirement. Then to seal it off for extra longevity, new PENTREAT™ 244-100, our hydrophobic, impregnating sealer that penetrates deep to help prevent chloride-induced corrosion of rebar, scaling, spalling, freeze-thaw damage, and other causes of concrete deterioration. It's the ultimate restoration preservation combination.

KATHARINE MORGAN BECOMES PRESIDENT OF ASTM INTERNATIONAL

Katharine "Kathie" Morgan began serving as president of ASTM International, one of the world's largest standards development organizations, on February 1, 2017. Morgan will lead a team that supports thousands of members, customers, partners, and other stakeholders worldwide. She succeeds James A. Thomas, who served in the role for 25 years.

"I am thrilled and humbled to serve as president of an organization that has played such a foundational role in meeting societal needs for over a century," Morgan said. "We will build on the legacy of Jim Thomas, attracting even more of the world's top technical experts to our committees while also serving people and organizations that rely on our standards and services."

"Kathie brings proven leadership skills, a deep understanding of the global standards community, a passion for ASTM International's mission, and much more," Thomas Marsh, CEO of Centrotrade and ASTM International's 2017 chairman of the board said. "ASTM International will continue to grow and thrive under her leadership."

Morgan is a 33-year veteran of ASTM International. She served as executive vice president for the past two years. Prior to that, she was vice president of Technical Committee Operations, leading a 50-member team that supports the volunteer work of ASTM International's 30,000 members worldwide.

Morgan is one of the world's most prominent voices on standardization-related issues. She is a member of the American National Standards Institute's board of directors, the Council of Engineering and Scientific Executives, the International Consumer Product Health and Safety Organization, the Society for Standards Professionals (SES), the American Society of Association Executives, and a former member of the Standards Council of Canada's Standards Development Organization Advisory Committee.

Morgan holds a bachelor's degree in chemical engineering from Lafayette College in Easton, Pa., and a master's degree in business administration from Widener University in Chester, Pa.

FLORIDA DEPARTMENT OF TRANSPORTATION RECOGNIZED BY ISI

The I-4 Ultimate Improvement Project in central Florida has earned the prestigious Envision Platinum recognition from the Institute for Sustainable Infrastructure (ISI) for its sustainability efforts of environmental, social and economic impact on the community and the 21-mile I-4 reconstruction project. This is the first project in Florida to receive recognition from ISI's Envision sustainable infrastructure rating system.

The I-4 Mobility Partners (I-4MP), the public-private partnership (P3) rebuilding Interstate 4 through central Florida, earned the Envision Platinum award for its ongoing programs to minimize environmental impacts, including relocating protected wildlife, using efficient machinery, controlling stormwater runoff, planting non-invasive vegetation, and recycling 99 percent of the concrete and steel removed from roads and bridges. The project also facilitates the use of alternative transportation by integrating rail projects and improving pedestrian crossings and connections with bike trails.

The I-4 Ultimate Improvement Project involves the reconstruction of 21 miles of roadway infrastructure from west of Kirkman Road in Orange County through downtown Orlando, extending to the east of State Road 434 in Seminole County. The project is expected to transform the region by better connecting communities, improving the local economy and enhancing livability for residents. One of the most important benefits will be the improvement of traffic flow by easing congestion with the addition of four new variable toll express lanes and the reconstruction of 15 major interchanges, which includes widening 13 bridges, replacing 74 bridges and adding 53 new bridges, along with a pedestrian overpass on Kirkman Road and a signature pedestrian bridge at Maitland interchange. When complete, the project will provide a visually appealing signature corridor with bold landscaping, accent lighting, enhanced bridge architecture and other aesthetic features.

Several industry leaders formed the I-4MP team to design, build, finance and operate the project through a 40-year P3 concession agreement with a total design and construction cost of $2.32 billion.

The members of the I-4MP team include:

- Skanska Infrastructure Development (Equity Member)
- John Laing Investments Limited (Equity Member)
- SGL Constructors (SGL) - Construction Joint Venture – Skanska (Lead Joint Venture Partner) Granite Construction Company and the Lane Construction Corporation
- Design Joint Venture – HDR and Jacobs Engineering Group, Inc.
- Infrastructure Corporation of America (Lead Operations and Maintenance Firm)

To learn more about the I-4 Ultimate Improvement Project, please visit http://i4ultimate.com.

THE CONCRETE CONVENTION AND EXPOSITION, DETROIT, MI, USA

Nearly 2,000 engineers, architects, contractors, educators, manufacturers, and material representatives from around the world will convene at the Detroit Marriott at the Renaissance Center in Detroit, MI, USA, March 26-30, 2017, to collaborate on concrete codes, specifications and standards. Technical and educational sessions will provide attendees with the latest research, case studies, best practices, and the opportunity to earn Professional Development Hours (PDHs).

The Greater Michigan Chapter of ACI is proud to host the convention this spring, as an opportunity to showcase the com-

panies, projects, current events, and landmarks that inspired the convention theme of Driving Concrete Technology.

Throughout the convention, ACI will hold over 300 committee meetings, 30+ technical sessions, an industry trade exhibition, networking events, and more. To learn more about the ACI Convention please visit www.aciconvention.org.

AMERICAN CONCRETE INSTITUTE ANNOUNCES RECIPIENTS OF THE ACI CERTIFICATION AWARD AND ACI CONSTRUCTION AWARD AT WORLD OF CONCRETE 2017

The American Concrete Institute (ACI) announced the recipients of the ACI Certification Award and the ACI Construction Award at a press conference during World of Concrete, Las Vegas, NV, USA, January 18, 2017.

N.J. Gardner, FACI, Professor Emeritus at the University of Ottawa, Ottawa, Ontario, Canada, received the ACI Construction Award. Gardner was recognized for the parametric analysis evaluation of flat plates constructed using a single level of shores and multiple levels of elastic reshores. Gardner has been an ACI Member since 1962.

Luc Monette, President of HP Engineering Inc., a structural engineering design firm in Ottawa, Ontario, Canada, received the ACI Construction Award. Monette was recognized for the parametric analysis evaluation of flat plates constructed using a single level of shores and multiple levels of elastic reshores.

William R. "Rod" Elderton received the ACI Certification Award for outstanding and tireless service in promoting, supporting, and delivering ACI Certification programs through the Southern California Chapter. Elderton is a retired manager of the Soils and Concrete Team for the Metropolitan Water District of Southern California. Elderton has been an ACI member since 2002.

Marc Jolin, FACI, is a Professor at Laval University Quebec City, Quebec, Canada. He received the ACI Certification Award for outstanding leadership and service on ACI Certification committees, and tireless service in developing, promoting, supporting, and delivering ACI Certification programs worldwide. Jolin has been an ACI member since 1998.

G. Terry Harris, Sr., FACI, received the ACI Certification Award for outstanding leadership and service on ACI Certification committees, and tireless service in developing, promoting, supporting, and delivering ACI Certification programs. Harris is director, Technical Service – Concrete for the Americas for GCP Applied Technologies, headquartered in Cambridge, MA. Harris has been an ACI member since 1984.

For more information on the ACI Honors and Awards, please visit www.concrete.org.

AMERICAN CONCRETE INSTITUTE MASONRY TESTING CERTIFICATION PROGRAMS INCLUDED IN NEW MASONRY DOCUMENTS

The American Concrete Institute's two masonry testing certification programs are now cited in TMS 402/602-16: Building Code Requirements and Specifications for Masonry Structures. Published in December 2016, the newly updated masonry documents include language referencing certification in accordance with the Masonry Field Testing Technician and Masonry Laboratory Testing Technician programs.

As stated in section 1.6 A of TMS 402/602: "Masonry testing laboratory personnel who are certified in accordance with ACI Masonry Laboratory Testing Technician Certification Program, or equivalent program, are qualified." Additionally, section 1.6 B states: "Field technicians who are certified in accordance with the requirements of ACI Masonry Field Testing Technician Certification Program, or an equivalent program, are qualified to observe and/or prepare masonry specimens." It is expected that the programs will be referenced in the 2018 International Building Code and International Residential Code.

"Due to a variety of factors, including an increased need for quality assurance, masonry testing is becoming more common. Unfortunately, in some areas, testing technicians are not always familiar with masonry, nor its nuances that make it different than concrete," said Phil Samblanet, executive director, The Masonry Society. "The result can be improper testing, poor results, and headaches in the field. ACI's Masonry Testing Technician Certification programs will further efforts to improve testing quality by letting contractors, designers, and owners know who is qualified to perform masonry testing."

ACI's masonry testing programs provide certifications to those technicians working in the laboratory or in the field who can demonstrate the technical knowledge and skills required for sampling and testing of masonry units, mortars, grout, and prisms. They are based on content from ASTM specifications.

"The masonry testing certification programs support advancing education with respect to proper techniques associated with masonry materials, and were created to help improve the quality of masonry construction," said John W. Nehasil, managing director of Certification, American Concrete Institute. "The industry will benefit from requiring ACI-certified masonry technicians."

The TMS 402/602-16 was produced by The Masonry Society's committee 402/602 on Building Code Requirements and Specification for Masonry Structures Committee. The committee was formerly designated as the Masonry Standards Joint Committee and was sponsored by The Masonry Society, American Concrete Institute, and the Structural Engineering Institute of the American Society of Civil Engineers. The Masonry Code was formerly ACI 530.

Program details for both masonry programs can be found on ACI's website at www.concrete.org/certification. At World of Concrete, the American Concrete Institute launched a new section of its www.concrete.org website called 'Why Certification.' The pages serve as a resource for individuals, specifiers, and employers looking for more information on why certification is important for careers and businesses. Specific resources include: listing of where ACI certification is required; sample language for requiring certification; steps for individuals to get certified; steps for employers to get their people certified; testimonials from industry peers; and more.

NYC DEPARTMENT OF DESIGN AND CONSTRUCTION'S SHELDON AVENUE STORMWATER PROJECT EARNS ENVISION® SILVER AWARD FROM ISI

New York City's Sheldon Avenue stormwater management project on Staten Island, executed by the Department of Design and Construction (NYCDDC) on behalf of the Department of Environmental Protection (NYCDEP), is the recipient of the Institute for Sustainable Infrastructure (ISI) Envision Silver sustainable infrastructure award. The ISI Envision rating system rates sustainable infrastructure across the full range of environmental, social, and economic impacts. This project is the NYCDDC's first to earn an Envision award for sustainability, and the second Envision project awarded in the city overall.

Currently in construction, the Sheldon Avenue project involves the creation of a natural wetland to more effectively and sustainably manage and filter stormwater captured from the local community. Additionally, sanitary sewers will be installed

to allow almost 600 local homeowners to be taken off septic systems, improving water quality, increasing home values, and eliminating the headaches for homeowners associated with managing these systems. This project is the largest expansion to date of the Staten Island Bluebelt, an award-winning, ecologically sound and cost-effective stormwater program created in response to frequent flooding on the island during rain events that were caused by a lack of sufficient stormwater drainage.

Key organizations involved in the planning, design, and construction of the project include NYCDDC, which is responsible for both the in-house design of the storm and sanitary sewers as well as construction management; NYCDEP, the client agency; Hazen and Sawyer, which is responsible for the design of the stormwater Best Management Practice (BMP) wetland; and Arcadis, which provided construction oversight services and steered the Envision application process.

The Sheldon Avenue project earned high scores in the Climate and Risk, Natural World, and Leadership Envision categories.

To learn more about the Sheldon Avenue stormwater management project, please visit http://www.nyc.gov/html/dep/html/dep_projects/bluebelt.shtml.

AMERICAN CONCRETE INSTITUTE RELEASES 2017 EDITION OF MANUAL OF CONCRETE PRACTICE

The American Concrete Institute (ACI) has released the printed and digital editions of its 2017 Manual of Concrete Practice.

Containing more than 250 documents, the ACI Manual of Concrete Practice is the most comprehensive and largest single source of concrete practice information available in one set. The Manual of Concrete Practice is a must-have for professionals in the concrete industry and contains all of the ACI documents needed to answer any questions about code requirements, specifications, tolerances, concrete proportions, construction methods, evaluation of test results, and many more topics. The Manual of Concrete Practice also includes the totally reorganized version of ACI 318, Building Code Requirements for Structural Concrete and Commentary.

An encyclopedia of concrete technology, the Manual of Concrete Practice has information needed by the engineer, architect, contractor, concrete/concrete product producer.

The 2017 Manual of Concrete Practice is conveniently available in printed and digital formats with prices as low as $395.00. Options include an eight-volume set with separate index, a USB drive, and

an one-year online subscription that includes all new and archived versions of the documents provided.

To order, please call 248-848-3800 or visit www.concrete.org.

AMERICAN CONCRETE INSTITUTE ANNOUNCES NEW STUDENT, FACULTY, & YOUNG PROFESSIONAL ACTIVITIES COORDINATOR

The American Concrete Institute is pleased to announce that Kanette Worlds has been promoted to Student, Faculty, and Young Professional Activities Coordinator. She began working for the American Concrete Institute in 2015, focusing on marketing outreach, building relationships, and improving two-way communication between ACI and its 200-plus domestic and international chapters.

In this new position, Worlds will be responsible for the development and management of activities and programs that support recruitment, retention, and engagement of students, faculty, and young professional members. The primary focus is to respond to the needs of the academic community and provide opportunities for young members to participate in career development.

Worlds received her Bachelor of Science in Business Communication with an emphasis in Marketing from Rochester College, Rochester Hills, MI, and previously worked in higher education as the public relations officer and student organization advisor at Rochester College. Her interest in international education led to the completion of a Certificate in African Studies from Yale University, New Haven, CT, and involvement with several global learning providers including Projects Abroad Tanzania, Youth for Understanding, and the Office of International Students and Scholars at Oakland University, Rochester, MI.

"Most people first become engaged with ACI during their time in school," said Ronald G. Burg, P.E., executive vice president, American Concrete Institute. "While ACI's free student e-membership is a great tool to increase the institute's engagement with students and universities, there is much more that we can do to strengthen our relationship with students during their schooling and in the years following. I am eager to see Kanette leverage her vast ACI and educational experiences to more closely align the institute's offerings with the needs of our student, faculty, and young professional communities."

In support of ACI's strategic goal of working to increase participation of, and adding value for its members, chapter members, and customers, Worlds will focus efforts on the identification and development of programs for students, faculty, and young professional members.

For more information, visit www.concrete.org.

AMERICAN PUBLIC WORKS ASSOCIATION ANNOUNCES 2017 JENNINGS RANDOLPH INTERNATIONAL FELLOWS

The American Public Works Association (APWA), in association with the Eisenhower Institute at Gettysburg College (EI), announced the selection of the 2017 Jennings Randolph International Fellows. Administered through the APWA International Affairs Committee, the Jennings Randolph International Fellows are accomplished public works professionals who study public works topics and projects internationally in association with APWA's international partner organizations. The Jennings Randolph International Fellowship Program, which was established in 1987, is a unique international study and professional exchange opportunity that promotes collaboration and sharing of public works best practices, knowledge, and innovation.

The three 2017 APWA Jennings Randolph International Fellows will conduct public works study tours and provide presentations at international partner associations' annual membership meetings in Perth,

Australia in August, 2017 and in Gothenburg, Sweden in September, 2017.

The APWA 2017 Jennings Randolph International Fellows include:

Evan N. Pratt, P.E., Washtenaw County Water Resources Commissioner, Director of Public Works, Ann Arbor,Michigan.

Joanne Zhang, P.E., CCM, Council Liaison, Executive Division, Bureau of Engineering, City of Los Angeles, California.

Aaron Putnam, Public Works Administrator, City of Ankeny, Iowa.

For more information about the APWA Jennings Randolph International Fellowship Program, contact the APWA International and Outreach Manager Lillie Plowman at lplowman@apwa.net.

LOS ANGELES' METRO EXPO PHASE 2 LIGHT RAIL AWARDED INSTITUTE FOR SUSTAINABLE INFRASTRUCTURE ENVISION® PLATINUM

The Los Angeles County Metropolitan Transportation Authority (Metro) Expo Line Phase 2 (Expo 2) Light Rail, a $1.5 billion, 6.6-mile-long project with seven stations, has received Envision recognition for sustainable performance from the Institute for Sustainable Infrastructure (ISI). The project earned the Envision rating system's highest award level—Platinum. It is the first Metro project that is Envision-verified.

The Expo 2 Light Rail extension provides a needed public transportation system that connects downtown Los Angeles to Santa Monica serving popular destinations along the route, such as the University of Southern California and West Los Angeles. Daily ridership is expected to remain high with more than 64,000 boarding passengers projected by 2030, making it one of the nation's highest-used light rail systems.

The Envision rating system recognizes sustainable infrastructure across the full range of environmental, social and economic impacts. There are a total of 60 credits in the rating system in five credit categories, including Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Risk. The Expo 2 project scored top marks in nearly all Quality of Life credits, due in part to its easement of traffic congestion, and for providing residents in Los Angeles with a faster, more environmentally responsible way of getting around.

Metro is committed to sustainability throughout the LA County transportation system, and is especially proud of the positive quality of life that the Expo Construction Authority and their contractor Skanska/Rados Joint Venture yielded on this project.

Team building and collaboration are core values for Metro, the Exposition Construction Authority and the project team. A significant investment was made by the owner, consultant and construction parties to foster a collaborative, integrated design process. A third-party facilitator was also brought in to develop and maintain and effective partnering program

throughout the design and construction phases.

Each of the seven stations along the rail line feature original works of art to help create a unique identity for each station, and enhance the passenger experience. The Expo 2 project is a prime example of effective sustainable infrastructure integration, another aspect that the Envision system rates in the Leadership credit category. The Expo 2 line integrates effectively with all City of Los Angeles transportation systems, including existing bike networks, bus routes, Metrolink Commuter Rail and the Metro subway system.

Photos and additional details regarding the Expo 2 project can be found at: https://www.metro.net/projects/expo-santa-monica.

THE INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION LAUNCHES THE 3RD EDITION OF THE ITA TUNNELLING AWARDS!

As the saying goes, "all good things come in threes" and that is particularly apt knowing the upcoming edition of the ITA Awards will be the third to be launched since the ITA decided to create the event in 2015 and, for this edition, to create three new categories! In 2017, the event will take place in Paris, on November 15, during the AFTES (French Association of Tunnelling and Underground Space) congress.

After two successful editions in Switzerland and Singapore, the ITA Tunnelling Awards is becoming an international standard for the tunnelling world. The two first editions of the ITA Tunnelling Awards received more than 200 entries and 64 nominations, rewarded 21 projects and personalities and gathered more than 450 attendees.

The application process is now open and candidacies can be registered until May 30th, in the ITA Tunnelling Awards website: https://awards.ita-aites.org/

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your association news to editor@icri.org. Editorial content for the July/Aug issue is due by May 1, 2017 and content for the Sept/Oct issue is due by July 3, 2017.

Celebrating 25 Years of Outstanding Concrete Repair Projects

PROJECTS AWARDS
ICRI
25th Anniversary-2017

CATEGORIES

High-Rise
Historic
Industrial
Longevity
Low-Rise
Masonry
Parking Structures
Special Project
Sustainability*
Transportation
Water Systems

2017 ICRI Project Awards

ICRI conducts an awards program each year to honor and recognize outstanding projects in the concrete repair industry. Entries are received from around the world, and the winning projects projects will be presented during the Awards Banquet at the 2017 ICRI Fall Convention. Each winning project will be featured in an article in the Concrete Repair Bulletin.

New for 2017!

- All entries must be submitted using our new online submission form.
- Deadline for receipt of entries is Thursday, June 1, 2017, 5:00 pm CDT.

Save On Your Entry Fee!

- Submit your entry by May 1, 2017 and pay an entry fee of $250.
- Submit your entry between May 2, 2017 and June 1, 2017 and pay an entry fee of $300

Judging Criteria
Entries will be judged on uniqueness, use of state-of-the-art methods, use of materials, functionality, value engineering, and aesthetics. The panel of five judges—selected by the ICRI Awards Committee—consists of engineers, contractors, and manufacturers from all over North America.

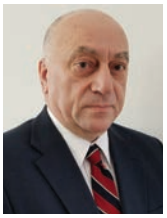
Eligibility
The project must be either completed after January 1, 2015, or be substantially complete before March 31, 2017. The company submitting the entry must be an ICRI company member. The portion of the project performed by the submitting company must amount to at least 25% of the project cost. (This does not apply to design firms or owners.) A subcontract for the repair portion of a larger project will be considered as the project.

***Optional Sustainability Award Entry**
Did your project incorporated sustainable repairs or modifications? To be considered as an outstanding sustainability project, in addition to your selected category, you will given the opportunity on your entry form to elaborate on sustainability considerations as set forth in the ICRI Sustainability for Repairing and Maintaining Concrete and Masonry Buildings White Paper.

Complete rules can be found at
www.icri.org

INTERNATIONAL CONCRETE REPAIR INSTITUTE
9700 W Bryn Mawr Ave., Suite 210 | Rosemont, IL 60018 USA
E-mail: awards@icri.org | Phone: +1 847.447.1701

PEOPLE ON THE MOVE


Dr. Michael A. Lucarelli

The ChemQuest Group, Inc., a leading business strategy firm in specialty chemicals, announces the addition of **Dr. Michael A. Lucarelli** as director.

With over 30 years of experience in organometallic, organic, inorganic, polymer and specialty chemicals, Dr. Lucarelli is a recognized subject matter expert and inventor in chemistry applications ranging from silicones, silanes, fumed silica, urethanes and epoxies to acrylics, particle technology and catalysis. Dr. Lucarelli possesses in-depth knowledge in coatings, adhesives, sealants and composites, which includes the chemistry of resins, additives and plastics and is accomplished at developing new chemistries within the specialty chemicals value chain.

Most recently, Dr. Lucarelli served for seven years as vice president of Product Development and Commercialization for Novinda Corporation, a startup producer of a mineral-based sorbent primarily used for removing mercury and pollutants from flue gases. From 2002 to 2008, Dr. Lucarelli was Wacker Chemical's Director of Technology where he had primary responsibility in the fumed silica and silane businesses. He has had diverse roles in marketing & sales support, technology & innovation, and manufacturing & distribution for new and existing end-products such as coatings, adhesives, sealants, and composites. Prior to that, Dr. Lucarelli made significant contributions in various senior R&D, application and technical service roles at Valspar, Cabot Corporation, GE Silicones and formerly the Mobay Corporation (now Covestro). As co-inventor, Dr. Lucarelli has an array of 63 patents and applications, while additionally authoring and co-authoring several technical papers.

In 1976, Dr. Lucarelli earned his Bachelor of Science chemistry degree from Adelphi University, followed by a Ph.D. degree in Organic Chemistry from the State University of New York in 1986, after serving in the U.S. Air Force.


Bernard Gustin

LATICRETE, a manufacturer of globally-proven construction solutions for the building industry, has announced that **Dr. Bernard Gustin** is retiring from the board of directors after 25 years of dedicated service.

Dr. Gustin is an independent management consultant, corporate director, and investor based in New York, with extensive experience in advising world-scale manufacturing, service and financial companies in the United States, Europe, and Asia.

Since 1994 Dr. Gustin has been an independent investor and financial advisor to a number of private family trusts and investment companies based in Europe, the United States and New Zealand, and a director of a privately held medium-sized international manufacturing company based in the US.

Dr. Gustin was a management consultant with McKinsey & Company, based in the firm's New York, Paris, and Amsterdam offices. He conducted complex consulting projects related to strategy, organization, marketing, operations, and cost-reduction in the US and Europe for such industrial and service companies as AT&T, Philips of the Netherlands, Corning Glass, PepsiCo, Philip Morris, American Can, and Price Waterhouse.

Dr. Gustin is deeply involved in philanthropy and a supporter of classical music and the arts on a worldwide basis. He is a citizen of the US, France, and Canada.

KOSTER American Corporation is pleased to announce the appointment of **Mr. Trent Denny** as Director of Sales effective January 13, 2017. Mr. Denny will be responsible for leadership of the company's nationwide sales force, strategic sales planning, and marketing. With 18 years' experience in coatings, sales, and operations management, Trent is excited to join the KOSTER leadership team. After serving in the Marine Corps, Trent developed an extensive knowledge of industrial coatings at PPG Industries over 13 years where he rose to Business Development Manager. He spent the past five years with Gaco Western, and was the Western Regional Manager for the last two years, developing expertise in leadership of sales for waterproofing systems. KOSTER is proud to have Trent on their team.


Trent Denny

INTERESTED IN SEEING YOUR PEOPLE IN THIS COLUMN?

Email your People on the Move announcements to editor@icri.org. Editorial content for the July/Aug issue is due by May 1, 2017 and content for the Sept/Oct issue is due by July 3, 2017.

CERTIFICATION PROGRAM

ICRI

PLAN NOW TO BECOME CERTIFIED...
RECERTIFICATION ALSO AVAILABLE!

CONCRETE SLAB MOISTURE TESTING

UPCOMING 2017 CERTIFICATION CLASSES:

MARCH 22 & 23 Chicago, IL Area	**APRIL 10 & 11** Denver, CO Area	**SEPTEMBER 27 & 28** Baltimore, MD Area

VISIT **WWW.ICRI.ORG** AND CLICK ON **CERTIFICATION** FOR MORE INFORMATION.

CHAPTER MEETINGS & EVENTS

ARIZONA
March 22, 2017
CHAPTER DINNER MEETING
Topic: Surface Preparation
Phoenix Airport Hilton
Phoenix, AZ

April 26, 2017
CHAPTER DINNER MEETING
Topic: Radar Systems
Phoenix Airport Hilton
Phoenix, AZ

BALTIMORE WASHINGTON
May 4, 2017
CHAPTER DINNER MEETING
Baltimore, MD

CAROLINAS
April 27-28, 2017
CHAPTER SPRING MEETING
Topic: Safety, Silica and Access
Marriott City Center
Durham, NC

CENTRAL FLORIDA
March 8, 2017
CHAPTER MEETING
Topic: Post-Tensioning
Red Lobster
Sanford, FL

April 7, 2017
CHAPTER OUTING
Sporting Clays Fund Raiser
Deland, FL

CHICAGO
April 18, 2017
CHAPTER DINNER MEETING
Topic: Chapter Project Award Winners
Westwood Tavern
Schaumburg, IL

CONNECTICUT
March 8, 2017
CHAPTER DINNER MEETING
Best Western Plus
North Haven, CT

DELAWARE VALLEY
April 17, 2017
CHAPTER DINNER MEETING
Maggiano's Philadelphia
Philadelphia, PA

FLORIDA WEST COAST
April 5, 2017
CHAPTER DINNER MEETING
Speaker: Steven Lessor
Holiday Inn Clearwater
Clearwater, FL

GEORGIA
March 30, 2017
CHAPTER LUNCHEON MEETING
Maggiano's Perimeter
Atlanta, GA

April 27, 2017
CHAPTER LUNCHEON MEETING
Maggiano's Perimeter
Atlanta, GA

GULF SOUTH
March 9, 2017
CHAPTER SPRING CONFERENCE
Pensacola Bay Center
Pensacola, FL

May 4, 2017
CHAPTER SOCIAL AND MEMBERSHIP DRIVE
Offices of JJ Moreley & Regions Field
Birmingham, AL

MINNESOTA
March 24, 2017
CHAPTER TRADE SHOW
Cement Masons Training Center
New Brighton, MN

METRO NEW YORK
March 22, 2017
CHAPTER TECHNICAL MEETING
Club 101, Park Ave.
New York, NY

FOR UPDATED CHAPTER ACTIVITIES AND FULL DETAILS ON THOSE LISTED HERE, VISIT WWW.ICRI.ORG.

NORTHERN CALIFORNIA
March 21, 2017
CHAPTER LUNCHEON & MEETING
Topic 1001 California Street
Centennial Restoration
Speakers: Lee Woolsey and Emile Kishek
Hs Lordships Restaurant
Berkeley, CA

NORTH TEXAS
April 5, 2017
CHAPTER MEETING WITH UTA's STUDENT CHAPTER
UTA's Engineering Building
University of Texas at Arlington

April 14, 2017
SPORTING CLAY EVENT – 3RD ANNUAL
Dallas Gun Club
Lewisville, TX

ROCKY MOUNTAIN
April 10 & 11, 2017
THE CONCRETE UNIVERSITY SYMPOSIUM
Arapahoe County Fairground
Aurora, CO

SOUTHERN CALIFORNIA
April 19, 2017
TECHNICAL PRESENTATION
Topic: Carbon Fiber Strengthening
Simpson Strong-Tie Facility
Riverside, CA

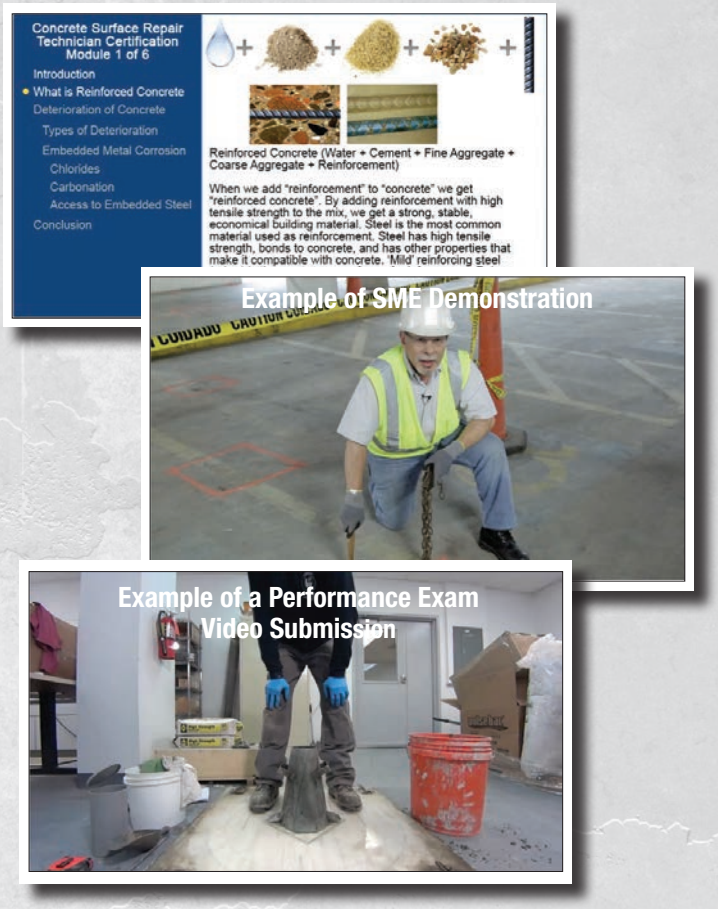
SOUTHWEST FLORIDA
March 21, 2017
GENERAL MEMBERSHIP MEETING
Crowne Plaza Holiday Inn
Fort Myers, FL

VIRGINIA
April 20, 2017
SPRING CHAPTER SYMPOSIUM
Topic: Infrastructure Repair
Colonial Heritage Golf Club
Williamsburg, VA

Are you looking to become qualified as a concrete surface repair technician and inspector?

The International Concrete Repair Institute has the program for you!

The ICRI Concrete Surface Repair Technician Certification Program



- Competency based program using current best practices for training and evaluation
- Includes five online training modules, an online knowledge exam, and performance exam (either video recorded or live at an on-site location)
- Qualifies individual to perform pre- and post-placement inspections and testing

*"The ICRI CSRT program has assembled a vast amount of information…**an individual can learn best practices that typically take 5 to 10 years to accumulate**. Whether you are new to concrete repair or experienced…**this program has something for everyone.**"*

Jacob Borgerson, Paradigm Consultants, Inc., Houston, TX
Certified Concrete Surface Repair Technician-Grade 1

Certification Program Development Resulting from Industry Demand and Code Language

INTERNATIONAL CONCRETE REPAIR INSTITUTE

For more information go to
www.icri.org

MINNESOTA HOSTS ANNUAL MEGA DEMO

The Minnesota Chapter 2017 Mega Demo was a record success! It welcomed more than 90 contractors, restoration engineers, students, teachers and manufacturer representatives. For this 2017 event, the focus was on Air and Vapor Barriers. One doesn't often think about Air and Vapor barriers as it relates to concrete repair. Building code requirements, material selections and jobsite coordination make the challenges relating to air and vapor barriers critical to the success of a project. Many of the players involved are concrete contractors and related tradespeople. The day consisted of classroom presentations, live demonstrations, the announcement of the new Minnesota Chapter Board Members, presentations for the 2017 Lifetime Achievement Award, two apprentice awards, three scholarships for students training to enter the concrete industry, as well as time for breakfast, lunch, and Q&A with concrete repair, vapor barrier, and restoration experts.

2017 president Andy LeBarron welcomed attendees as they settled into their seats with hot coffee and donuts in hand. Every person in attendance introduced themselves and how long they have been in our industry. Many attendees had decades of service to our industry, and it's great to see the folks just getting their feet wet. Getting started with classroom education was presenter Brain Carey from Carlisle Coatings & Waterproofing. Much of the conversation revolved around evolving and often challenging building codes. Air and vapor barriers tie into below grade waterproofing, masonry and the roof structure. Critical to the success of the job is getting many people on the same page. Building envelope transitions always require solid communication between the masonry, concrete, waterproofing and carpentry trades. The advent of NFPA 285 has made compliance a critical factor to the success of a job. Because so many wall assemblies and designs exist, it can be a challenge to ensure that everything is installed correctly and to specification.

The first live demonstration was presented by Joe Butler from Carlisle CCW. He has extensive field training and has helped many contractors become proficient in correctly applying air and vapor barriers to every substrate. Luckily for ICRI, the Cement Masons Training Center graciously donated time and material to build mock walls of concrete and masonry CMU to allow for a great live demo. Sheet membranes, spray applied membranes, and window & penetration details were all covered. It also showed the importance of concrete repair and preparation. For high performing air and vapor barriers to work as designed, it is critical that concrete and masonry surfaces are repaired correctly and finished so that the substrate is ready for air and vapor barriers. Attendees were put to work, architects challenged speaker Joe Butler with questions (that he easily handled), and everyone watched as Joe taught how to do things the right way!

Following Joe's great live demonstration, ICRI was lucky to have Dick La Fond from American Engineering testing. Identifying issues and troubleshooting air and vapor barrier jobs is something that Dick is very familiar with. Over the years Dick compiled a great number of jobsite stories and photos to show just about every way a job can get stuck. Fortunately for us, his experience can help us identify and avoid problems. One of the main takeaways from Dick's presentation was the great importance of the pre-installation meeting. Having people assembled together in person allows for the active and clear communication necessary for success. Considerations including surface prep, material selection, weather forecasting, site conditions all must be

Dick LaFond with American Engineering Testing discusses issues and troubleshooting air & vapor barriers

Garet Hovest with BASF demonstrates detail work for thin-mil air & vapor barriers

2017 President Andy LeBarron (left) with Minnesota Chapter Scholarship to winners Jami Sehm and Mike DeMars as well as the Chapter's Education Chair Mark Sheriff (right)

The Minnesota Chapter teamed up with the Cement Masons and Bricklayers to select a trade scholarship winner from each training class. Pictured (from left to right) are: President Andy LeBarron, scholarship winner Jamie Wilson from the Cement Masons, Dave Schutta, Education Chair Mark Sheriff, John Slamma, and scholarship winner Poa Vang from the Bricklayers.

In recognition of his outstanding contribution to the concrete repair industry, Terry Babcock with CMI was awarded the Minnesota Chapter's 2017 Lifetime Achievement Award. Pictured (from left to right): President Andy LeBarron, Board Member at Large Terry Babcock & Vice President Kim Deibel

Minnesota Chapter members watch as Carlisle CCW demonstrates spray applied air & vapor barriers

With a record breaking 90 plus people in attendance, there was standing room only. The 2017 Mega Demo was one of the most successful events the Minnesota chapter has hosted

made. Dick also spoke about the 2015 Minnesota Energy Code requirements that drive many of these considerations.

The ICRI Minnesota 2017 Apprentice Award was granted to Pao Vang and Jamie Wilson. Dave Schutta from the Cement Masons Training Center had nothing but positive things to say about the work Jamie has done to become a great concrete finisher and he was rewarded with at $500.00 award to purchase tools he will need at Brock White. John Slamma from the Bricklayers and Allied Craftworkers training center introduced Pao Vang. Pao was awarded $500.00 to use at Advance Specialties. It's great to have young people entering our industry! Congrats Pao and Jamie! ICRI awarded scholarships of $1500.00 to Mike Demars, Haile Werke, and Jami Sehm. All three are pursuing a degree in the concrete and construction field. Nice work Mike, Haile, and Jami!

As attendees left the classroom for lunch in the main hall, they had the opportunity to check out samples and literature about air and vapor barriers as well as concrete repair solutions. There was time to catch up with colleagues and meet some of the new and old faces that represent manufacturers and material suppliers.

After lunch the ICRI MN 2017 Lifetime Achievement Award was presented to a very surprised Terry Babcock from Construction Midwest, Inc. Terry has been a friend to many in our business and it was an honor to watch him receive the award. Thank you, Mr. Babcock!

BASF was on hand for the afternoon sessions to talk about and demonstrate thin mil air and vapor barriers. Once again the attendees moved into the demonstration area where Dan Wald from BASF covered thin mil air and vapor barriers. Traditionally, flashing windows and corners have been difficult. BASF presented a novel approach that involved a liquid flashing applied directly to the substrate that was subsequently covered by a reinforcing fabric. Once the fabric was rolled into place, another liquid flashing application finished the procedure. Time savings as well as total protection from moisture into the building envelope were accomplished. Garet Hovest demonstrated the system.

ICRI Minnesota is grateful to the Cement Masons Local #633 for allowing the use of their training center! There was huge effort by their team to ensure a great area and space for the 2017 Mega Demo. ICRI would also like to thank all of our sponsors with table tops at the Mega Demo. Chapter sponsorships help make this great event possible and it ensures reasonable pricing for all attendees. If you are interested in sponsoring, please visit www.ICRIMN.com for additional information. See you at the 2018 Mega Demo!

TORONTO HITS THE GROUD RUNNING

The ICRI Toronto is up to 20 members and growing fast! Toronto's first event was held February 21, 2017 at Cluny Bar/Bistro in the historic Distillery District in downtown Toronto. More than 30 people were in attendance. Those gathered were able to enjoy some networking, get an update on ICRI, and witness a presentation given by ICRI Toronto Chapter board member Stephan Trepanier on "Evolution and Repair of Unbonded Post-Tensioned Buildings". It was a great first event by the newest ICRI chapter! If you have friends or colleagues in the Toronto area, make sure you have them sign up as a member.

FLORIDA WEST COAST HOSTS CORROSION PRESENTATION

On February 1, 2017 the Florida West Coast Chapter hosted a chapter meeting at the Holiday Inn Clearwater with guest speaker Jorge Costa from STRUCTURAL. Jorge gave a presentation on Why Steel in Concrete Corrodes

CHICAGO CLOSES 2016 IN STYLE

The ICRI Chicago Chapter ended 2016 with some terrific events. In October the chapter hosted an Educational Seminar on Shotcrete. The presentation included a morning session on the history, the variety of different applications, as well as the conventional uses of Shotcrete. The classroom presentations were followed by multiple live demonstrations in the afternoon. The Chicago Chapter wants to thank all of their generous sponsors and give a special thank you to their colleagues at William Hach & Associates for hosting the event at their facilities.

The final event of the year for the Chicago Chapter was their annual Holiday Social. This year they gathered to golf in the snow. To be fair, there might have been snow outside, but the event was held indoors at a local TopGolf facility. In addition to the golf the Chapter continued with tradition and included their popular Texas Hold-Em Tournament while the clubs were still swinging nearby. Fun was had by all and there was a great showing.

The Chicago Chapter hosted an educational seminar on shotcrete

The demonstrations were held outside the William Hach & Associates facility

The Shotcrete seminar included live demonstrations on shotcrete applications

The Chapter's Holiday Social was held at a local TopGolf facility

The Holiday Social festivities included the Chapter's annual Texas-Hold-Em Tournament where Chapter President Chris Kottra (left) from BTC took 3rd place, Tom Lawler (center) with William Hach & Associates took home 1st place, and Bill Mahler (right) with Carl Walker placed 2nd in the tournament

METRO NEW YORK HOSTS HOLIDAY CELEBRATION

On Thursday, December 8, 2016 the Metro New York Chapter of ICRI hosted their 8th Annual Holiday Party at Ruth's Chris Steak House in Midtown Manhattan. It was the perfect time to pause and enjoy catching up with friends and colleagues. A very sizeable crowd gathered to also reflect on the past year while looking ahead to 2017 and the ringing in of the New Year. As always, the chapter would like to take the time to say thank you! Days like this would not be possible without the help and support of all of our Sponsors.

BALTIMORE-WASHINGTON RAISES BIG BUCKS FOR SCHOLARHIPS

On Friday October 15, 2016 the International Concrete Repair Institute Baltimore-Washington Chapter held its annual golf tournament at Piney Branch Golf Club in Upperco, Maryland to benefit the Chapter Scholarship Fund. The tournament was initially postponed for the second year in a row due to inclement weather, a trend we hope to break in 2017. Prior to the postponement on October 4, 95 golfers had registered to play; an above average attendance number compared to previous tournaments. Just like last year, after the postponement the tournament added golfers whose schedules were clear on the day of the make-up date and we had a total of 108 paid. Unfortunately, a number of previously scheduled golfers couldn't accommodate the make-up date so the actual number of golfers dropped to 89 the day of the event. The majority of the "no-shows" declared this a few days before the tournament so we were able to work with the club to only pay for the golfers in attendance—a considerable cost savings. Furthermore, many of the no-shows donated their entry fees to the chapter making the tournament considerably more profitable.

The day of the tournament brought typical October conditions. A little chilly in the morning but comfortable for those in pants and long sleeves by the 9th hole of play. The course was in fantastic condition as was noted by many of the participants. Again this year there were a number of on-course competitions highlighted by the two marquis competitions: the hole-in-one contest for $10,000 sponsored by PPSI and the $10,000 putting contest sponsored by Manganaro. Unfortunately, for the second year in a row, a hole-in-one was not recorded. The putting contest provided some late day excitement when Troy Mynch slammed a 40-foot putt in the back of the cup only to have it bounce out, narrowly missing the grand prize of $10,000.

The tournament (not without challenges presented by Mother Nature) was again a success and the chapter raised more than $5,000 to benefit the Chapter Scholarship Fund. Even though the tournament was well attended, the real benefit to the organization comes through the generous donations by the sponsors. A special thanks to the sponsors is in order! Sponsors were: Concrete Protection and Restoration, Lunch Sponsor; Restoration East, LLC, Beverage Cart Sponsor; PPSI, Hole in One Sponsor; Manganaro, Putting Contest Sponsor; Choice Restoration Services, Range Ball Sponsor; Tools and Accessories, Breakfast Sponsor; Scaffold Resource, Men's Long Drive Sponsor and Women's Long Drive sponsor; and Coretec, Women's Closest to the Pin.

The many companies that donated to the cause as Hole sponsors also deserve to be named. Sponsors were: ABC Equipment Rental, BASF, Commercial Waterproofing, Conproco, Contracting Specialists Inc., CP&R, Eastern Industrial Scaffold, Engineering Technical Consultants, Euclid Chemical, Freyssinet, GE Momentive, Kenseal, Manganaro, MAPEI, Metro Sealant Waterproofing/ Evonik, Pecora, PREPCON, Sika Corporation, STRUCTURAL, and Valcourt.

Finally, the Chapter would like to give a shout-out to the volunteers, and their companies that give of their time to make this tournament run smooth. Thank you to Larry Burkhardt with Conproco, Jay Whitton with Valcourt, Brunna Figuerido with CP&R, as well as Tara Minter from Scaffold Resource.

GEORGIA HOSTS MONTHLY LUNCHEON ON STUCCO SYSTEMS

The Georgia Chapter of ICRI held its monthly luncheon on January 1, 2017, at the Maggiano's in Perimeter Mall. A total of 49 attendees were part of the January luncheon, and Everclear Enterprises Inc. was the sponsor. The meeting started out honoring the chapter's past president, Bryan Heery, for all the hard work he put into the ICRI Georgia Chapter in 2016. Then we were fortunate to have two presenters for the month of January. The first was Mike Levin the Executive Director of ICRI. He spoke about Region 2 representative, John

The Georgia Chapter welcomed almost 50 attendees for their January meeting at Maggiano's in Perimeter Mall

McDougall and how he (as a member of the ICRI Board of Directors) can be of service to the chapter. He also provided information on the Surface Repair Technician Program, the Concrete Slab Moisture Program and the new ICRI Secretariat—a group of dedicated volunteers working to nurture new ideas within ICRI. The featured technical presenter was Mr. Lee Cope, an associate principal with Wiss Janney Elstner Associates (WJE). He has been with WJE for 18 years and specializes in façade systems. Mr. Cope's presentation focused on deteriorated or damaged stucco/ EIFS systems. The attendees were educated about the three types of wall assemblies found with stucco or EIFS systems (barrier walls, mass walls, and cavity walls) and the common conditions and repairs made to them. Most stucco/ EIFS wall systems eventually end up cracking, sealants failing, get punctured, or delaminate because of improper installation. While most owners or contractors recommend acrylic or elastomeric coatings for a fix, Mr. Cope argued that this is not always the case. Sometimes it is more cost effective or preventative to reclad, overclad, or placing EIFS lamina over the failed system.

ROCKY MOUNTAIN HOLIDAY PARTY CELEBRATES 2016 AND 2017

The Rocky Mountain Chapter held its annual holiday party at the TopGolf location in Centennial, Colorado to celebrate the end of another successful year. As part of the festivities, the new Board of Directors were introduced and the traditional "Fez of the Prez" transfer ceremony took place. Receiving the "Fez of the Prez" for 2017 was Kim West with ASR Companies. Angela Echols from Procoat Systems is the incoming Vice-President and Mike Devlin with Rocket Supply is the incoming Secretary. Terry McGovern from Wiss, Janney, Elstner Associates has once again volunteered to be the Chapters Treasurer. The 1st Year Directors elected for 2017 include Dave Reis with ASR Companies, Chad Grote from Jon-Don and Chris Yoder who is with Summit Sealants & Restoration. We welcome our new Board members and look forward to a successful 2017.

New Rocky Mountain Chapter Officers for 2017 are; (left to right) Vice-President Angela Echols, Immediate Past President, Jake Holland, President, Kim West, and Secretary, Mike Devlin

Transferring the Fez of the Prez for 2017 are out-going Rocky Mountain Chapter President Jake Holland (left) from Summit Sealant & Restoration and in-coming President Kim West who is with ASR Companies

2017 CHAPTER NEWS DEADLINES

MAY/JUNE
March 10, 2017

JULY/AUGUST
May 10, 2017

Send your Chapter News to Dale Regnier, Chapter Relations Director, at daler@icri.org

CHAPTER NEWS
CHAPTERS COMMITTEE CHAIR'S LETTER

JOHN McDOUGALL
Chapters Chair

Oh what a year it was! 2016 was a year of prosperity for ICRI, a year of growth for the Chapters community and, I trust, a great year for all of our members. None of it would have been possible without the dedicated efforts of the ICRI Board of Directors, ICRI management (including our Chapters Director, Dale Regnier) and our outgoing and passionate Chapters Committee Chair Mark LeMay. Thank you to all of you.

For 2017, President Brian Daley has challenged the Board and all Committee Chairs to focus our message and efforts on enhancing ICRI's educational opportunities to its members. I see the best conduit for this message is through our Chapter Leaders. While we have continued growth in attendance at our Conventions, we recognize the efforts of our local chapters and their ability host, educate and network with their membership anywhere from two to eight times each year. Chapter meetings will see upwards of 75% of the ICRI membership at least once each year. This is a metric indicative of a great network of Chapters delivering high quality programs and events - well done!

With the new Concrete Surface Repair Technician (CSRT) Certification now live, we have developed a presentation we are happy to deliver at Chapter meetings. The ICRI Concrete Moisture Testing program is in its 7th year and running as strong as ever. Working with ICRI there has been an opportunity for some local chapters to host a training and certification event. ICRI staff has been able to coordinate the necessary resources and deliver a program that works with a chapter meeting as long as there are a certain number of interested individuals available to register for the certification. Be sure to contact ICRI if you are interested.

I encourage all Chapter Leaders to visit the websites, Facebook pages and twitter feeds of other Chapters, as well as read the Chapter News Section in the CRB. If there is a topic, newsletter format, speaker, or special event that captures your interest; we, Dale and I, can help connect those dots for you and your Chapter. I'm always happy to help develop a newsletter template, reach out to a speaker on your behalf, or share my experience as Past President of the Carolinas Chapter.

By now someone in your Chapter Leadership has toiled over the Annual Report and the Chapter Awards Forms. Thank you! It is possibly the single best tool as a Chapter Leader there is to assess the goals, direction and content quality of your Chapter. The forms and points system are both living documents that we are always looking for ways to tweak, adjust, improve or streamline. Please share any comments with me via email and we will take your suggestions to the Chapters Committee to review and possibly implement in a later version of the Awards program.

The most recent addition to the Awards program is the opportunity to recognize Chapter participation in local service projects. This may be best modeled after a program developed by the Rocky Mountain Chapter. They worked diligently over the course of many months to create a 'Repair Outreach Program' which delivered the Award Winning Service Project at The Denver Children's' Home, in Denver Colorado. The Rocky Mountain Chapter, like many ICRI Chapters work to give back to their local communities. This recognition helps bring those projects and efforts to the minds of other ICRI Chapters and members across the country.

In case you had not yet heard, we want to extend a welcome to ICRI's newest Chapter, Toronto. The expansion of ICRI into Canada's largest city is exciting for ICRI and all of our Candian friends. Growth in that chapter has been exceptional and we look forward to it continuing as they get settled in. Congratulations go out to Stephen Franks, Stephan Trepanier, and David Huggins who spearheaded and continue to lead the Toronto team!

Finally, and I can't stress this enough, please continue to share your Chapter calendars with Dale Regnier (daler@icri.org). We want to include all possible updates in the calendar section and Chapter News section of the Concrete Repair Bulletin. Chapters are of vital importance to ICRI and the Board of Directors. I hope you know that at any time you can reach out to me for help, guidance, and coordination (jmcdougall@bakerrestore.com).

All the best,
John McDougall
Director, Region 2
Chapters Committee Chair
Past President, Carolinas Chapter

NEW PRODUCTS

ASV INTRODUCES NEW VT-70 VERTICAL LIFT COMPACT TRACK LOADER FOR SUPERIOR PERFORMANCE IN LIFT-AND-CARRY APPLICATIONS

ASV LLC, an industry-leading manufacturer of all-purpose and all-season compact track loaders and skidsteers, introduces the company's first mid-frame, vertical lift compact track loader, the Posi-Track VT-70. The machine features a vertical lift loader linkage for applications requiring extended reach and level loads, such as loading pallets and handling hay bales. The VT-70 features best-in-class rated operating capacity, cooling systems and hydraulic efficiency. The compact track loader excels at lift, carry and load tasks as well as heavy digging in industries such as agriculture, construction and excavation.

ASV builds the VT-70 from the ground up. The innovative undercarriage features ASV's patented Posi-Track rubber track suspension. The single-level suspension is made up of two independent torsion axles per undercarriage, allowing for a smooth ride over every type of terrain and speeds as fast as 11 mph.

The VT-70 features a Kubota 2.4-liter turbocharged diesel engine. The 65-horsepower engine produces 146 foot-pounds of torque. Planetary drive motors transfer the torque to the patented internal-drive sprockets. Internal rollers prevent friction loss in the undercarriage, resulting in all power being transferred to the track regardless of drive speed.

The VT-70 features a rated operating capacity of 2,328 pounds and a tipping load of 6,650 pounds. It is 66 inches wide and has a 10.5-foot lift height.

For more information on the VT-70 and available options, visit ASV LLC's websites: www.asvllc.com or www.positrack.com. Interested in seeing the equipment for yourself? Visit a dealer near you.

ATLAS COPCO LAUNCHES INDUSTRY'S FIRST GAS BREAKER WITH ELECTRONIC FUEL INJECTION

Atlas Copco introduces its PROi gas breaker with electronic fuel injection (EFI), an industry first that offers significant benefits for users needing to break concrete, cut asphalt, tamp soil or drive ground rods. The Cobra PROi provides as much as 10 percent more power than its predecessor, the PROe, at all working speeds, while optimal combustion reduces fuel consumption by as much as 10 percent. Operators can start the breaker in almost any climate or at any altitude.

An integrated mechanical fuel pump employs a unique system that maintains constant pressure to the regulator without electricity. Atlas Copco also designed the PROi with a custom electronic fuel injection system that uses just 3 psi, 40 psi less than standard EFI systems. This approach minimizes pressure variations and voids in the fuel, ensuring smooth running. Starting the breaker is easy in any conditions; the Engine Control Unit activates during the first revolutions when the user pulls the starter cord.

Hand-arm vibration level on 3 axes is below 4 m/s2 to minimize operator fatigue. The light, compact machine weighs just 53 pounds, so users can easily move it and transport it in a car's trunk.

The PROi 2-stroke, 90cc engine delivers as much as 44 foot-pounds of breaking force due to the unique arrangement of the gearbox percussion system. This force is equivalent to 793 pounds hitting the chisel every second.

Since the Cobra PROi stays in tune, maintenance is minimal. Also, its high-capacity air filter has a long lifetime and can be easily accessed for fast servicing. Visit www.atlascopco.us for more information.

ATLAS COPCO UPGRADES WALK-BEHIND CONCRETE POWER TROWELS

Atlas Copco's three new walk-behind power trowels — the BG 245, BG 375 and BG 475 — include upgraded features that enhance versatility and safety on a variety of applications, from fine edge to rough surface concrete finishing.

The units can be equipped with either a twist pitch or quick pitch for optimal performance on a wide range of jobs. Atlas Copco also designed the trowels with its exclusive QuickStop feature that stops the blade rotation immediately after the operator releases the handles. This results in zero-degree spin that minimizes the risk of injury.

The BG trowels' QuickStop feature includes a belt clutch that immediately stops the blade rotation with zero-degree handle spin for maximum operator safety. In addition, QuickStop doesn't kill the ignition when the trigger is released, allowing the speed to be adjusted without damaging the belt and clutch.

The BG trowels are equipped with Honda gas engines that deliver 5.5 to 9 horsepower. They offer variable speeds for a variety of tasks, from high-speed burnishing to low-speed, high torque floating.

The BG power trowels feature a palm trigger in robust steel as well as foldable de-vibrated handles for enhanced comfort. Their detachable throttles can be moved from the left handle to the right, which enhances comfort and ease of use for left- and right-handed operators.

The BG 245 features a rubber edged floating protection ring to prevent damaging walls, which makes it ideal for use on indoor worksites where a wall or other obstacle exists. The BG 375 and BG 475's larger size offers efficient operation on bigger, outdoor applications, such as driveways.

Visit www.atlascopco.us for more information.

BROKK HEIGHTENS POWER & EFFICIENCY WITH BROKK 110 REMOTE-CONTROLLED DEMOLITION MACHINE

Brokk, the world's leading manufacturer of remote-controlled demolition machines, presents the Brokk 110. The electric-powered machine features increased demolition power over its predecessor, the Brokk 100, and includes the all-new Brokk SmartPower™ electrical system. The machine's improvements increase the reliability and versatility for Brokk customers working on harsh jobsites in industries such as construction, metal processing, mining and nuclear.

The new machine features a 10-foot (3-meter) reach and weighs 2,183 pounds (990 kilograms). It delivers 15 percent more power than the older Brokk 100 and 50 percent more than its predecessor, the popular Brokk 90 (discontinued in 2011) while retaining its compact design, making it ideal in restricted spaces and on weak floors.

The Brokk 110 includes Brokk SmartPower, the company's all-new electrical system, which is also available on the new Brokk 120 Diesel and Brokk 280.

Brokk SmartPower optimizes performance based on a number of factors, including power supply quality and ambient temperature.

The Brokk 110 also features upgraded durability. This includes hardened parts, LED headlight protection, reinforced corners and a new steel gray color coating in strategic areas to add additional resistance to dirt and scratches.

The Brokk 110 is compatible with the same wide range of attachments available for the Brokk 100 that it replaces.

Visit www.brokk.com for more information.

E-Z DRILL OFFERS CONCRETE DOWEL DRILL AND DUST COLLECTION SYSTEM RENTALS THROUGH DEALER NETWORK

E-Z Drill's rental program provides contractors a cost-effective method to complete concrete dowel drilling jobs. The program is offered throughout more than 60 E-Z Drill dealers across North and South America, Europe, Asia and Australia, and it allows customers to rent or re-rent E-Z Drill's most popular units and Dust Collection Systems.

"We understand that contractors might not be ready to buy a new drill," said Rick Walstad, E-Z Drill president and CEO. "This program offers a solution to those who do infrequent concrete drilling and doweling or who are just getting started in the business. They have a less expensive way to achieve the production, efficiency, and ease of use that comes with E-Z Drill."

E-Z Drill's line of concrete dowel drills enhance safety, efficiency, and operator comfort on a variety of projects, such as lane additions, full-depth repairs and airport runway construction. They feature one to five-gangs and operate on the grade or slab. The machines eliminate the need for hand drilling and allow projects to be completed quickly, with hole drilling speeds as fast as 20 – 30 seconds.

E-Z Drill's Dust Collection System gives contractors a solution to Occupational Safety and Health Administration's Table 1 requirements for crystalline silica exposure. The vacuum system uses the same air compressor as the concrete dowel drill to effectively collect dust directly from the drilled holes and store it in a collector.

Visit www.ezdrill.com for more information.

NEW 2017 SMITH CATALOG RELEASE

SMITH Manufacturing of Pompano Beach, Florida has recently released its new 2017 product catalog, featuring new and updated items to be used in surface preparation.

An additional feature of the new SMITH catalog is the inclusion of the Surface Profile Inspection Tool, designed to be used on the jobsite to ascertain the optimum surface profile, and how to achieve it. It is located in a special fold-out section in the back of the catalog.

There are also separate catalogs for the striper/asphalt and the flooring/concrete industries. SMITH Manufacturing is a leader in the manufacturing of surface preparation equipment for asphalt and concrete surfaces. The goal is safer, more-sustainable surfaces performed quickly and inexpensively.

If you would like a copy of the new 2017 SMITH catalog, visit smithmfg.com/catalog.php to download it, or contact your SMITH representative at 800-653-9311 and SMITH will send one to you.

GRACO INTRODUCES COMPACT—NEW SOLUTION FOR EFFECTIVE AND EFFICIENT CLEANING AND SURFACE PREPARATION

Graco Inc., a leading manufacturer of fluid handling equipment, is pleased to announce the new EcoQuip 2™ EQp, part of the EcoQuip 2 family of Vapor Abrasive® blast equipment. Featuring a portable cart with lift handles that allows users to transport the device from one job to another, this new machine is an affordable option for many surface preparation jobs.

EQp is a unique offering in the market because it is as powerful and easy to use as the larger EcoQuip models, but at a more affordable price for smaller scale jobs. Contractors and restorers can now complete their blasting jobs quickly and effectively without blowing the budget.

While there is ultimately no such thing as dustless blasting, the EQp emits up to 92 percent less dust than traditional dry blasting, and works with coarse, fine or non-destructive blast media. The equipment is designed for a variety of applications including steel and concrete surface preparation, graffiti removal, paint and stain removal from wood, brick and patio cleaning, and iron fence and railing prepa-

ration. Long blast times of 30 to 60 minutes between refills, along with low water usage, allows users to complete the job quickly and efficiently. In addition, the machine features fast removal rates compared to other methods, such as pressure washing, with blast pressures up to 150 pounds per square inch (psi).

To learn more about Graco's EcoQuip EQp and the EcoQuip 2 family, visit www.graco.com/EQp.

NEW AIR-SHIELD TMP LIQUID MEMBRANE FROM W. R. MEADOWS PRESENTS NEW CONSTRUCTION OPTIONS

Building on a reputation of manufacturing innovative waterproofing products, W. R. MEADOWS is now introducing AIR-SHIELD™ TMP. A single component, vapor permeable, thin film liquid membrane for both new construction and retrofit applications, it is specifically formulated to act as an air and liquid moisture barrier when applied to most common surfaces.

AIR-SHIELD TMP is a water-based air/liquid moisture barrier that cures and forms a tough and seamless elastomeric membrane. The bonus is it can be applied to nearly any surface and integrated into many wall systems.

AIR-SHIELD TMP is also flexible, providing the transmission of moisture vapor through porous building materials and bridging cracks, which could form in the substrate. Applied in liquid form, it produces excellent adhesion and simplifies detailing with a seamless membrane when applied to rough or smooth surfaces. User friendly and UV resistant, it can be left exposed for up to six months. With low VOC content, it can be applied at air and surface temperatures of 20°F and higher. AIR-SHIELD TMP is available in five-gallon pails or 55-gallon drums.

For more information about AIR-SHIELD TMP or other products, visit www.wrmeadows.com.

BOSCH GBH2-28L 1-1/8" BULLDOG™ XTREME MAX SDS-PLUS® ROTARY HAMMER OFFERS 8.5 AMPS OF POWER AND BOSCH-EXCLUSIVE KICKBACK CONTROL

For trade professionals who demand a concrete drilling tool that brings the power every day, all day – the Bosch GBH2-28L 1-1/8" SDS-plus® Rotary Hammer is the right tool for the job. With 8.5 amp power delivered by 2.4 Ft.-Lb. motor, this is a rotary hammer that combines outstanding power with excellent speed.

The Bosch GBH2-28L rotary hammer merits its place in the long line of legendary Bosch Bulldogs. It weighs only 6.9 lbs., yet delivers impact energy of 5,100 no-load bpm (blasts per minute) and 0-1,300 no-load rpm for drilling and chipping in masonry and concrete. The 1-1/8 in. diameter drilling capacity combines with three operation modes – drilling only, hammer drilling and chiseling – to ensure the Bosch GBH2-28L is ready to take on a variety of jobs, both big and small.

Bosch-exclusive KickBack Control is activated when there's an unexpected bind-up situation, which the rotary hammer will immediately shut off to reduce dangerous tool kickback. KickBack Control helps to better control the rotary hammer and can reduce the risk of injury.

Additional user protection features includes vibration control, a counter-balance system that moves in the opposite director of the striker to optimize hammer action. And an overload clutch is included on all Bosch rotary hammers. In an overload situation the tool remains in operation, but the clutch disengages to prevent dangerous torque movement.

To accommodate optimized chiseling, the Bosch GBH2-28L includes Vario-Lock™ positioning that allows the user to rotate and lock a chisel into the best working angle. The multi-function selector makes it easy to switch the modes for drilling only, hammer drilling and chiseling. Users can adjust tool settings based on application and material.

The rotary hammer has a variable-speed reversing trigger for accurate bit starting to enhance productive. It has a hammer hook that offers quick tool storage during the job. And the ergonomic D-handle design is ideal for both overhead and downward drilling applications.

To learn more about the Bosch GBH2-28 1-1/8" Bulldog™ Xtreme Max SDS-plus® Rotary Hammer or to find a local dealer, visit www.boschtools.com or call 877-BOSCH-99.

V-S2A | SELF-CLEANING HEPA INDUSTRIAL VACUUM

The V-S2A industrial vacuum cleaner has a dynamic and mobile system, ideal for superfine dust extraction following the floor grinding and concrete polishing process.

V-2SA is installed with a power-driven filter cleaning system, which drives the plectrum to strongly shake off the dust accumulated on the filter. It is a very innovative and cost-effective cleaning system.

CFM: 262
H2O: 86 in.
Weight: 216 lbs.
Height: 47.5 in.
Width: 22.5 in.
Depth: 31 in.
Single Phase 110v
2 HEPA Filters
2 Motor Vacuum

Learn more: https://www.healthyairtechnologies.com/product-page/v-s2a

NEW PRODUCT REDUCES COSTS FOR MUNICIPAL DRINKING WATER STORAGE TANKS

LiquaTile 1172 Distributed by NSP Specialty Products Is A Game Changing

Coating /Internal Lining For Potable Water and Other Sensitive Environments

NSP Specialty Products (NSP) announces an exclusive distribution agreement for a new and innovative coating for potable water tanks and pipes that replaces NSP's industry respected NSP 120. Seeing a need to address modern problems in the water industry, NSP contacted Wolverine Coatings Corporation, a formulator and manufacturer of heavy-duty, industrial coatings and linings. Tasked with NSP's requirements, the innovative minds at Wolverine developed LiquaTile 1172, a game changing new coating and internal lining product that cost effectively protects potable (drinking) water storage tanks at a time of tight budgets for infrastructure maintenance and expansion.

Derived from the same research & development team behind the coatings industry's ground breaking Advanced Hybrid Cycloaliphatic (AHC) technology, LiquaTile 1172 is a fast-cure, low-odor, high durability tank lining solution that attains industry-leading water quality levels without requiring expensive plural component application equipment and special techniques.

LiquaTile 1172 is a 100% solids epoxy coating which is UL Water Quality certified to US & Canadian NSF/ANSI 61 & NSF/ANSI Standard 372. It is certified for tanks 50 gallons and above, as well as for pipes 16 inch diameter and above. It can be applied with a brush and roller or airless spray equipment, with return to direct water contact in 5 days. No specialized equipment or curing procedures are required.

For more information about LiquaTile 1172 and other- heavy-duty, industrial coatings and linings from NSP, contact Larry Harrison at (910) 235-0468, (800) 248-8907, or lharrison@nsp-specialty.com.

CUSTOM® ENHANCES MOBILE ACCESS TO PRODUCT INFORMATION INTRODUCES MOBILE APP FOR IPAD AND MOBILE-OPTIMIZED WEBSITE

Custom® Building Products, the leading provider of flooring preparation products and tile and stone installation systems, recently unveiled a "made for iPad" version of its interactive mobile app and optimized its website for all mobile devices. The increased availability of product and service information through mobile technology allows CUSTOM® to effectively and efficiently accommodate the needs of tile installers, contractors, specifiers, architects, designers, distributors, retailers, homeowners and other customers.

Built for use on iPhones, iPads and Android tablets and smartphones, the free CUSTOM mobile app provides a robust menu of interactive options that are helpful for installing, protecting and maintaining tile and stone. The Custom Building Products mobile-optimized website features navigation that directs contractors, distributors, architects, designers and homeowners through a customized user-experience. Both mobile resources feature the following elements.

Products: descriptions with features and benefits; technical data sheets and safety data sheets that can be downloaded or e-mailed to the user or shared with an associate.

Color Selector: color options for all of CUSTOM's grouts including Fusion Pro™, Prism®, CEG ™ Lite, CEG-IG™, Polyblend® and SimpleGrout®.

Material Calculator: helps users determine the correct amount of surface prep material, setting material and grout based on surface area, tile and stone dimensions, and grout joint thickness. This tool allows for more precise calculations based on the unique attributes of the tile installation.

VidCUSTOM encourages customers to learn more about its products and services by visiting www.CustomBuildingProducts.com.

LATICRETE® SUPERCAP® LAUNCHES NEW READY-MIX DELIVERY SERVICE. PREMIUM UNDERLAYMENT DELIVERED TO YOUR JOB, WET OUT OF THE HOSE

There is something new in ready-mix. LATICRETE® SUPERCAP®, a leading manufacturer of quality self-leveling materials delivered through their industry leading patented pump truck technology, announced today that the company is introducing a new turnkey service called SUPERCAP Ready-Mix Delivery. SUPERCAP's Ready-Mix model will enable end users of its SLU to get the benefits of the company's pump truck technology and quality material delivered in bulk. SUPERCAP Ready-Mix Service will deliver its premium cementitious self-leveling underlayment directly to a jobsite, wet out of the hose. The benefits are convenient hassle-free service, consistent quality, increased jobsite safety, OSHA silica dust compliance and unmatched volume. All of these benefits combine to produce better outcomes and faster build-outs leading to significant time-savings on the project schedule.

With the launch of this new service, there are now three easy ways to access the LATICRETE SUPERCAP System: simply order Ready-Mix delivery by the project, lease a truck or buy the truck. We found that contractors using traditional methods of pouring self-leveling underlayment are making the leap to high volume systems that require less labor and create less jobsite disruption.

LATICRETE SUPERCAP is a proven Lean Construction tool that provides outstanding benefits to projects right from the start of concrete placement in Division 3 and flows through to Division 9. With the ability to pour up to 50,000 sf (4645 m^2) in one day and deliver material up to 50 stories high, this system has been proven with more than 100,000,000 sf (9290304 m^2) installed across North America. With

the increased volume the Supercap Ready-Mix pump truck provides, the GC can finish as much as 4X more square footage in one day. It makes sense, especially when every GC has a sharp eye on their schedules.

Visit www.laticretesupercap.com for more information

CINTEC TECHNOLOGY ANNOUNCES INNOVATIVE NEW DISSIPATIVE ANCHOR

New anchor ideal for protecting historic buildings in areas of high seismic activity

CINTEC International, a world leader in the field of structural masonry retrofit strengthening, repair, and preservation, announces that it has developed a new type of dissipative wall anchor. The new anchor solves the issues of how to protect heritage buildings in some of the most earthquake-prone parts of the world.

This new product is an innovative dissipative anchor designed for use with Cintec's proven wall anchor system.

The standard Cintec anchor system consists of a stainless steel anchor body encapsulated in a fabric sock. Diamond holes are drilled into the building and each anchor is placed in a hole. A specialized grout in pumped to the far end of the anchor, filling from back to front until the entire sock is inflated like a balloon. After the anchor has been inflated, the walls have been securely strengthened without affecting the outside appearance of the building.

For buildings subject to regular earthquake activity, there is a possibility of pull-out damage at the anchorage head. The new anchor solves this problem by allowing for small amounts of movement through a sliding mechanism.

The Cintec dissipative anchor consists of a set of stainless steel plates to which four bolts apply pressure, creating friction to an adjustable degree. There are built-in stops to restrict the sliding motion, and connectors that link to Cintec's standard anchor rods. The anchor allows a controlled and repairable drift for the walls, managing the amount of seismic energy fed into the structure and therefore minimizing damage to the building.

The development of this anchor resulted from Cintec's involvement with the European NIKER project. In 2011, Cintec was chosen as the only British commercial company to actively participate in this project, the aim of which was to protect the artistic value of cultural heritage sites from earthquake-induced damage. Cintec has been working in collaboration with the University of Bath to create and test the dissipative anchor since then, and has now patented the finished product.

Cintec anchors have been used to strengthen and restore historically significant structures around the globe, including Egypt's pyramids, Windsor Castle, and even the White House.

Visit www.cintec.com for more information.

QUIKRETE® LAUNCHES NEW ADVANCED-TECHNOLOGY REPAIR PRODUCTS

Superior Bond Strength Delivers Permanent Results Even in Hairline Cracks

The QUIKRETE® Companies, the leading manufacturer of packaged concrete products for the building and home improvement markets, recently introduced three new repair products: QUIKRETE® FastSet™ Concrete Crack Repair, QUIKRETE® Epoxy Concrete Repair and QUIKRETE® Polymer Modified Structural Repair.

QUIKRETE® FastSet™ Concrete Crack Repair

Specially formulated as a self-leveling, low-viscosity material, QUIKRETE® FastSet™ Concrete Crack Repair penetrates deep into cracks ranging from hairline to 1 inch before gaining bond strength that delivers permanent repairs. QUIKRETE® FastSet™ Concrete Crack Repair is a rapid-curing, two-part hybrid polyurethane crack repair material that can have traffic on driveways, basements, garages, bridge decks, sidewalks and other horizontal concrete surfaces open in one hour. The 8.6-ounce cartridges are applied with a standard caulk gun and available for approximately $20.

QUIKRETE® Epoxy Concrete Repair

A rapid-curing, two-part epoxy with non-sag characteristics, QUIKRETE® Epoxy Concrete Repair is ideal for vertical and horizontal bonding and repair applications in concrete, brick, stucco and other cementitious materials. The 8.6-ounce cartridges are applied with a standard caulk gun and available for approximately $17.

QUIKRETE® Polymer Modified Structural Repair

A polymer-modified, rapid-hardening, high-strengthen material, QUIKRETE® Polymer Modified Structural Repair is designed for partial-depth repairs in vertical and horizontal surfaces from feathered edge to eight inches thick. It can also be extended with gravel for full-depth repair more than four inches. QUIKRETE® Polymer Modified Structural Repair, which can be shaped to match the surrounding surfaces, is available in 20-pound pails for approximately $13.

Visit www.quikrete.com for mor information.

INTERESTED IN SEEING YOUR NEW PRODUCTS IN THIS COLUMN?

Email your new product information to editor@icri.org. Editorial content for the July/Aug issue is due by May 1, 2017 and content for the Sept/Oct issue is due by July 3, 2017.

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