July/August 2018
Vol. 31, No. 4

CONCRETE REPAIR BULLETIN

A Bimonthly Publication of the International Concrete Repair Institute

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CRB EDITORIAL DEADLINES

November/December 2018—September 4, 2018
Theme: *2018 ICRI Project Awards*

January/February 2019—November 1, 2018
Theme: *Cracks and Joints*

March/April 2019—January 2, 2019
Theme: *Resiliency: Above and Beyond Concrete Restoration*

May/June 2019—March 1, 2019
Theme: *Corrosion*

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ON THE COVER: Rehabilitated Union Depot in St. Paul, MN. Inset: Depot structure before rehabilitation. See page 22 for the full story.

CONCRETE REPAIR BULLETIN

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FEATURES

DEPARTMENTS

NOTE FROM THE EDITOR

As this issue reaches you, summer is in full swing and fall is quickly approaching. ICRI has been busy with Moisture Certification Testing and Concrete Repair Technician Classes and planning the remainder of 2018. Local chapters have been treating membership to Demo Days and Golf Outings.

The 2018 Fall Convention is rapidly approaching. This year's theme is *Resiliency: Above and Beyond Concrete Restoration* and the event will be held at the Omaha Marriott Downtown at the Capitol District in Omaha, Nebraska. The convention, November 7-9, will provide a great networking opportunity for all members as well as a wealth of technical information.

This issue of the *Concrete Repair Bulletin* contains articles on sustainability and re-purposing within the concrete repair and restoration industry. I hope you all are having a successful construction season and I look forward to seeing you all in Omaha in November!

Jerry Phenney, Editor, CRB
MAPEI Corporation

UPCOMING DATES & INFORMATION

CERTIFICATION CLASS
Concrete Slab Moisture Testing Certification Program
- September 19-20, 2018—Baltimore, MD Area

2018 ICRI FALL CONVENTION
November 7-9, 2018
Theme: *Resiliency—Above and Beyond Concrete Restoration*
Omaha Marriott Downtown at the Capitol District, Omaha, Nebraska

PRESIDENT'S MESSAGE

What does it mean to be a member of the International Concrete Repair Institute?

RALPH C. JONES

I trust the members of the International Concrete Repair Institute (ICRI) are busy and prosperous this summer season.

ICRI prides itself on being an organization made up of members from many different professions with a mixture of all segments of the repair industry. As a result, membership in ICRI probably means different things to different members. Our membership is made up of design professionals, contractors, manufacturers, government, educators, property owners/managers and others.

Each of these different sectors of our industry has specific tasks and goals related to their professions. Each approaches problems and opportunities from a different view point and, in return for their membership and effort in ICRI, each expects a specific return on their investment of time and effort put into the organization. For some, the goal is advancing their knowledge base. For some, it is advancing their products. For some, it is networking with like-minded individuals. For some, it is giving back to the industry that they love. For others, it is improving their personal performance. But the thing that is apparent to me is that each person who is a member of ICRI has one common goal—to improve the concrete repair industry. That is it in a nutshell and somehow ICRI is able to orchestrate all of these specific needs and goals together.

ICRI is the only organization dedicated solely to advancing concrete repair. When ICRI was first formed 30 years ago the statement of purpose was "To improve the quality of concrete restoration, repair and protection, through education of, and communication among, the members and those who use their services." Over the course of 30 years it hasn't changed and, I believe, there is a place in ICRI for each person who shares that common goal of improving concrete repairs and by extension the concrete repair industry. This is a belief also held by the leadership of ICRI.

On behalf of the ICRI Board of Directors and ICRI staff, I am happy to announce the launch of a new Membership Committee dedicated solely to advancing membership in ICRI. While membership has always been an important part of ICRI, this new committee will be specifically focused on enhancing membership within the organization. Their mission will be to listen to members (and non-members) of ICRI, and foster membership in the organization.

Jeff Barnes (Board of Directors member and Secretariat of ICRI) has agreed to spearhead the launch of this new committee. Thank you, Jeff. Jeff is looking for members in ICRI to join him and others to staff this important committee. They will be developing the specific goals and procedures for launching this committee and moving it forward. The ICRI Membership Committee will work to expand the organization's membership constituency to enhance a thriving and vibrant community of professionals dedicated to excellence, innovation, and education of concrete repair.

If you are interested in being part of this committee, having your voice heard and forming the groundwork to improve membership in ICRI, then please reach out to ICRI Executive Director Mike Levin at mikel@icri.org.

The launch of a new Membership Committee is just another of the exciting initiatives underway in the organization. For all of us dedicated to improving the *quality of concrete restoration, repair and protection*, I invite you to contribute to ICRI and have your specific goals met in combination with others in the industry, and achieving the common goal of improving our industry.

It is an exciting time to be a member of ICRI.

Ralph C. Jones, PE
2018 ICRI President

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TACTALK


FRED GOODWIN

At the ICRI Spring Convention, a lot of activity occurred. Here is a summary of what each technical committee is doing. All technical committees are open to all convention attendees and joining a technical committee is as simple as completing the committee application form at http://www.icri.org/?page=Join_Committee. If you want to learn about something, this is a great opportunity to interact with leaders in the industry actually doing work in different areas.

110 Guide Specifications

Incoming Chair Liying Jiang
Outgoing Chair Karl Rickert

A PowerPoint presentation to market the structural concrete repair guide specification and present our approach to developing the specification with lessons learned for use at professional meetings is being developed. TAC comments have been addressed and some photographs will be added to complete the presentation. The committee also plans to develop a webinar and make presentations to some local chapters before the next convention. The Epoxy Injection guide specification was sent out for ballot by the committee with all affirmative votes received. All primary comments from the committee members were addressed during this convention. The plan is to re-ballot for "no-protest consent" within the committee within two months and then send it to TAC for review. The Cementitious Bonded Overlay specification was sent out for ballot by the committee and has negatives to resolve. The committee discussed the direction of this document during this convention and will continue working on the document and reballot within the committee, with the goal of reballoting before next convention. A *CRB* article will be submitted before the next convention. The committee will work with ICRI to send out a membership survey to look for suggestions for future guide specifications and make a new plan to lead their development during the next convention.

120 Environmental Health and Safety

Chair Paul Farrell

CRB articles from Sam Dickson and Pete Haveron were submitted and published in the May/June 2018 issue. An update of the 120.1 document is planned by Spring 2019 but is a very large undertaking. Given the status of the 120 Committee at this time, it was discussed whether the 120.1 document be turned into an app based on a living document or to continue with a printed/downloadable document. The committee is preparing a safety moment checklist for ICRI meetings to remind everyone of the importance of safety. This document will include exit locations, emergency response notification, a survey of CPR and first aid trained individuals, and other useful information to be used at the beginning of ICRI meetings. Development of an ICRI Safety Award is being considered through coordinated efforts of the 120 committee, the Awards committee, and the Secretariat. New members interested in promoting safety, environmental quality, and worker health are asked to apply for membership.

130 Procurement Methods

Incoming Chair Michael Saulnier
Outgoing Chair Leo Whiteley

Document 130.2 *Guideline for Procurement of Concrete Repair Services* has been submitted to TAC for review and the committee received comments back from TAC. The committee addressed those comments and resubmitted to TAC and are now awaiting the compliance check on response to TAC comments. An article for the *CRB* will be submitted after 130.2 has been published. Document 130.1R *Guide for Methods of Measurement and Contract Types for Concrete Repair Work* needs to be reviewed and updated. New members interested in improving the procurement and contracting process of the concrete repair industry are asked to apply for membership.

160 Life Cycle Performance and Sustainability

Chair Pete DeNicola

The chair was absent, so TAC contact Ashish Dubey conducted the meeting. An informal discussion regarding development of a booklet that highlights the concrete repair sustainability story through various concrete repair field applications and projects, perhaps using various ICRI Award Projects where there is good documentation of environmental sustainability attributes as source material, was the meeting topic. A conference call to develop this idea further is planned. Ideas for attracting new talent to the committee for contributions and telling the environmental sustainability story to different stakeholders in the concrete repair industry were also discussed. This committee really needs new members and increased participation. Life cycle performance and sustainability are the fundamentals of concrete repair.

210 Evaluation

Co-chairs Dennis Wipf and Todd Allen

The document 210.4 *NDE Methods for Condition Assessment, Repair, and Performance Monitoring of Structures* has been reviewed by TAC but comments were received too late to be incorporated before the convention. Some of the primary comments were reviewed in the meeting. The Tensile Bond Pull-off webinar is nearly complete with committee comments addressed by the subcommittee. The webinar will be sent back to the committee for final review and then submitted to TAC. This is ICRI's first webinar developed by a committee and will be a great asset to the repair community. A task group was formed to explore rebar cleanliness such as development of a tool like the surface preparation chips that can be used to evaluate the cleanliness of rebar from corrosion. Development of a white paper on the use of drones in urban environments is pending TAC approval of the new idea.

Continued on page 6

Continued from page 4

310 Surface Preparation
Chair Pete Haveron

Pete Haveron showed all members how to go to the Causeway website to look up rosters, ballots, draft documents, published documents, minutes, agendas, etc. All committee activities are being handled using the Causeway System. Development of a PowerPoint presentation for evolution into a webinar is progressing through a task group for 310.2 *Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays and Concrete Repair*. An app for surface preparation profile (as suggested to the Secretariat) is being discussed. A task group has been formed regarding a potential partnership to produce concrete specimens of CSP chips.

320 Concrete Repair Materials and Methods
Chair Ashish Dubey

Revision of 320.1 *Guide for Selecting Application Methods for the Repair of Concrete Surfaces* will be balloted soon to resolve two negatives from a previous ballot. Revision of 320.2 *Guide for Selecting and Specifying Materials for Repair of Concrete Surfaces* has been approved and is awaiting publication. Revision and merger of 320.3 with ACI 364.3 *Repair Material Data Sheet Protocol* is progressing now that an understanding has been reached between ICRI and ACI on how to achieve this task. 320.5 *Pictorial Atlas of Concrete Repair Material Mixing Equipment* is adding new sections on pumps and shotcrete equipment. 320.6 *Guide for Evaluation and Repair of Unbonded Post-Tensioned Concrete Structures* is also scheduled for revision and will continue to be an ICRI/PTI joint document with the Post-Tensioning Institute taking the lead on the revision. A new document 320.7 *Guideline for Structural Grouts Material Data Sheet Protocol* has been reviewed by TAC and reconciliation of TAC compliance comments is underway. A major effort to develop an educational/training audio-visual tool on *Cracks in Concrete—Identification, Cause, and Prevention* is underway, with the first of a planned 20 online module program developed into the learning module system of ICRI with committee negatives being addressed. The plan is to have five new modules for different crack types completed by November.

330 Strengthening
Chair Tarek Alkhrdaji

Most of the committee's efforts are focused on development of a certification program for fiber reinforced polymer composites (FRP) that currently consists of seven modules. A training plan and detailed outline have been submitted to TAC and the committee is revising to include comments as well as continue to develop the program. The training modules for Tier 1 should be completed and submitted to TAC next year, and Tier 2 will follow for a scheduled completion in 2020.

410 Masonry
Co-chairs John Wathne and Patrick Morrissey

Work continues to develop the *Guideline for Terra Cotta Restoration* with the plan to complete and ballot the document by Fall 2018. The *Guideline for Repair and Strengthening of Masonry Façade Structures* is still under development.

510 Corrosion
Outgoing Chair Matt Sherman
Incoming Chair Jorge Costa

Review for revision of 510.1 *Electrochemical Techniques to Mitigate the Corrosion of Steel in Reinforced Concrete Structures* has begun. Much of the committee work has focused on development of 510.2 *Use of Penetrating Surface Treatments for Corrosion Mitigation of Reinforced Concrete Structures*. This document was successfully balloted and reviewed by TAC, but received two appeals. The accepted appeal is being addressed as primary TAC comments and the rejected appeal will be used for editorial revision of this version with remaining comments taken up as new business. Other documents under development include a guideline for half-cell survey which is about 90% completed and planned for committee ballot by Fall 2018. A guideline for corrosion rate measurement is about 50% complete and planned for committee ballot by Spring 2019. A task group has been formed to evaluate the potential for producing physical samples of reinforcing steel with varying stages of corrosion and cleaning to illustrate the desired surface preparation like CSP profile chips, based on an idea submitted to the Secretariat.

710 Coatings and Waterproofing
Chair H. Peter Golter

A Committee Members Questionnaire will be distributed to re-establish voting interest. Subcommittee 710-B *Moisture Mitigation* is resolving primary and secondary comments and addressing their subcommittee ballot negatives before submitting their updated document to the main committee for balloting. Subcommittee 710-D *Polymer Flooring* is currently working with NACE/SSPC to update the joint document 710.1 *Guide to Design, Installation, and Maintenance of Protective Flooring Systems*, with ICRI being the leading organization for this joint document. Subcommittee 710-E is revising their grouting document 340.1 *Non-Structural Grouting for Leaking Structures* to be ready for ballot by the main committee. ■

***Fred Goodwin** is chair of the ICRI Technical Activities Committee.*

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SECRETARIATUPDATE

PIERRE HÉBERT

The Secretariats are very excited to see how many interesting ideas are sent our way. We are following up with committee chairs on managing 33 ideas! As of May 3, we have received 11 ideas in 2018. For example, Scott Harrison proposed that we post Chapter meeting dates on an ICRI Master Calendar. Andy Garver proposed that we have a demo day as part of conventions. Another idea was that ICRI put together a video to inform (and market) our association to students in high schools, middle school, trade schools/college level. As you can see, some ideas can benefit how we run things better. Other ideas are leading us to consider exploring what we could offer outside our association. We are also receiving quite a few ideas about certifications. This is great because it is totally in line with one of the core values of ICRI's Strategic Vision and Plan on Professional Development.

We all agree that safety is (or should definitely be) a top priority for companies. We should want employees to go back home safe and sound and return to their jobs in the morning. It reminded me that during an ICRI Chapter breakfast meeting in Quebec City in May, the presenter said that safety was one of the major priorities discussed with his staff before going on job sites to perform evaluations or inspections. To that end, before beginning his presentation, he pointed out where the closest emergency exits were in relation to the meeting room we were sitting in as well as a few other safety tips. Quite coincidentally, I couldn't help but remember that

I'd read about an idea submitted back in 2017 by Scott Greenhaus about safety! Scott suggested that we create more awareness and discussion of safety, share stories and create discussion, and learn from each other. He suggested that a safety moment could be a success story, incident, or injury and lessons learned; and such a moment could refer to a safety related item that occurs at work or at home, 24/7. This resulted in ICRI promoting a "checklist" of safety items for committee chairs to be discussed at the start of meetings.

I know it was already mentioned in past issues of the *CRB*, but please send us your ideas. You never know how much you could end up helping fellow colleagues or people outside our association make potential life changing decisions for the better! ■

***Pierre Hebert** is an ICRI Secretariat, past member of the Technical Activities Committee (TAC), and a member of Committee 320 Concrete Repair Materials and Methods.*

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Steven Bruns Joins ICRI as Organization's First Full-time Certification Manager

ICRI Sees Rapid Growth in Certification and Education Programs

In order to meet the industry's growing demand for education and certification products, the International Concrete Repair Institute (ICRI) has hired its first full-time certification manager. Steven Bruns, PE, who is a former member of the ICRI board of directors, will serve the repair industry while helping fulfill ICRI's mission and strategic plan.

"Steve's background and experience are well-suited to meet this challenge and further ICRI's foothold as the leading resource for concrete repair education, training and certification," said Ken Lozen, ICRI's technical director. "ICRI is very fortunate to bring Steve on as a full-time staff member as he brings very relevant industry experience and connections to the Institute. We are confident the ICRI certification program will grow even more rapidly with Steve helping to market the program and train the industry."

ICRI is bringing Bruns on board in a full-time role in order to address the growth of ICRI and implement its strategic plan for providing certification and educational programs. He will work to increase the awareness and participation of ICRI certification programs while reporting directly to Lozen.

Among the new position's key responsibilities are:

- Manage, implement and promote existing and future certification programs
- Coordinate with the ICRI technical director and ICRI professional development manager for successful development and implementation of certification programs
- Utilize partners and chapters to market and promote ICRI certification programs to their members and audiences
- Establish and promote the use of ICRI certifications in industry/project specifications and codes

"Adding a new staff member to ICRI continues the exciting growth of new programs and benefits for members and the industry," said ICRI Executive Director Mike Levin. "The new position will enable the ICRI technical director to focus on other technical aspects of ICRI and provide more products and greater services."

STEVEN BRUNS, PE

ICRI currently has two certification programs which have proven popular in the industry, and expects to offer more programs in the future as Bruns promotes and administers both existing and new programs. Bruns brings extensive private and public sector experience to the position, and holds degrees from Purdue University and Indiana University.

For more information on the certification and education programs, visit the ICRI website. ■

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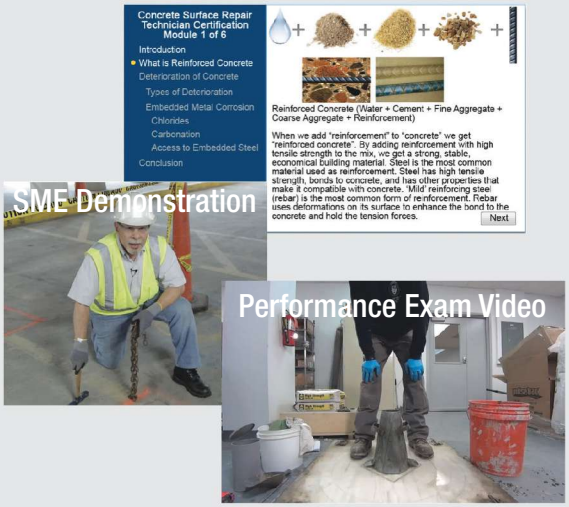

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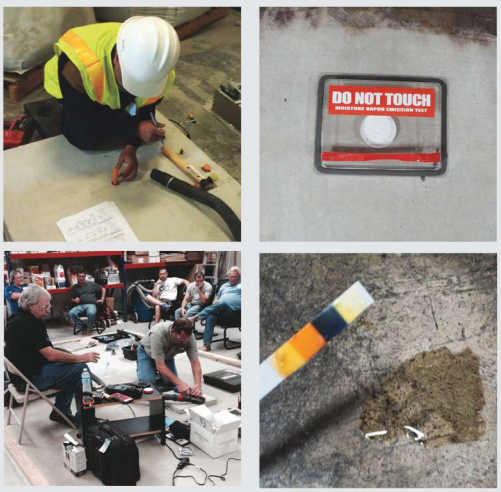

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ICRI**PERSONAL**AWARDS

Fellows

Being named an ICRI Fellow is recognition of an individual's long-term, devoted and enthusiastic service to ICRI. An ICRI Fellow is responsible for many noteworthy contributions to ICRI and the concrete repair industry in general. Criteria for nomination is based on outstanding contributions to the production or use of concrete repair materials, products, or structures in the areas of education, research, development, design, construction or management; an individual shall have been an ICRI member for 5 consecutive years. Nominations are currently being accepted for 2018 and an application can be obtained by contacting the ICRI National office.

Mark DeStefano

Mark DeStafano has made many contributions to ICRI for over 20 years at the National level as well as the local Chapter level. Mark has served on the ICRI Board of Directors, providing engineering support on several technical committee task groups and served on two different Florida ICRI chapters. Mark has made generous financial contributions to ICRI and has never failed to add his support when asked to join a committee or an ICRI activity. Mark's friendly and vivacious personality along with his technical expertise have been the perfect combination to encourage new members, existing members and senior members to remain positive and enthusiastic about ICRI and its future. An organization requires many types of members to be a strong and successful organization that remains relevant to the industry. Mark DeStefano adds his exuberance mingled with his industry knowledge to make ICRI a noteworthy industry leader.

Ashok Kakade

Ashok has been a Member of ICRI since July 1990 and is a principal engineer with Concrete Science, Inc. Ashok Kakade is a Licensed Civil Engineer with 35 years of experience. During his 27 years as a member of ICRI he has given numerous educational lectures both locally and nationally. He has been the Chairman of ACI 364-Rehabilitation as well as the founder and past president of the ICRI Northern California Chapter. Ashok has held many positions with the Northern California Chapter including secretary, vice president, president and board member. He has also dedicated countless hours toward several of the chapter's bi-yearly educational symposiums that continue to draw many members and non-members to the Northern California chapter. ■

Mark DeStefano took a few minutes to thank all those who continue to support him at ICRI

ICRI Fellow recipient Ashok Kakade (left) with ICRI Fellows Committee Chair Peter Golter (right)

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Sustainable Construction: Building a Better Tomorrow

BY DAVID WHITMORE

Fig.1: Concrete repairs, strengthening, and protection of concrete cooling towers (North Dakota)

In the construction industry, "sustainability" has in many ways become synonymous with LEED and environmentally friendly building design. However, it is important to consider that one of the most environmentally friendly and sustainable construction activities is "preservation"—the desire to reuse, restore and rehabilitate existing infrastructure to save both economic and natural resources. Together, the two terms create the concept of "sustainable construction."

Sustainable construction aims to meet present day needs for housing, working environments and infrastructure without compromising the needs of future generations. It places a significant responsibility on owners, designers and engineers to conserve resources by refurbishing and restoring existing structures whenever possible. Ideally, demolition and building new structures is only considered when an existing structure's condition has become "fatal"—physically and financially impossible to resuscitate.

When you consider that for the first time in human history over half of the world's population now lives in urban environments, the concept of sustainable construction is no longer just a "good idea." With urban populations swelling around the world, there's an urgent need to optimize the sustainable performance of the built environment we live and work in and move toward a more sustainable construction standard.

The Concrete Jungle

Human-built structures such as buildings, parking facilities, transportation grids and so forth have a significant impact on our environment. In terms of sustainable development practical, effective and sound environmental management of our built environment is more demanding than ever. Considering around 50% of the global population lives in cities, they account for more than 75% of the consumption of non-renewable resources.[1] These numbers are pushed higher when you factor in the environmental consequences of new construction projects.

According to the World Economic Forum, the construction industry is the single largest global consumer of resources and raw materials (almost 50% of the total). Up to 40% of solid waste is derived from construction and demolition activities alone.[2] Imagine the enormous accumulations of waste and the consumption of natural resources if we simply knocked down every existing structure after only a decade or more to make way for a range of bigger, better, sleeker new buildings built using all new materials and resources?

Alternatively, if 10,000 cy (7646 cm) of concrete is preserved, it avoids the release of over 9,000 lbs (4082 kg) of nitrous oxides and 5,500 tons (4990 metric tons) of carbon dioxide, which is equivalent to annual emissions of about 1,250 people. Preservation of 10,000 cy (7646 cm) of concrete conserves over 19,000 tons (17,237 metric tons) of natural resources that would otherwise be used to produce aggregate, cement, and steel. It also saves enough potable water to fulfill the daily needs of 2,500 people, prevents over 20,000 tons (18,144 metric tons) of rubble from being sent to a landfill, and prevents the release of enough heat to boil 30 Olympic-sized swimming pools.[3]

These numbers add up to one truth—preserving or reusing existing infrastructure is the preferred sustainable solution for facility managers to accept and implement.

Bridging the Gap between Sustainability and Replacement

Preservation and rehabilitation play a key role in most successful bridge management programs in the United States, primarily due to limited funds and increased competition for funds between highway assets. This challenges bridge owners to cost-effectively preserve and maintain their bridges to support overall mobility and service commitments to the public. When faced with the inefficient and cost-prohibitive constraints of traditional replacement practices, long-term maintenance and sustainability have become an integral component of asset management and a bridge preservation program.

A bridge preservation program consists of performing cost-effective Preventative Maintenance (PM) activities that prolong service life and delay the need for rehabilitation or replacement. Sound PM activities are effective when it comes to extending the service life of bridges in good or fair condition, and delays the need for costly replacement or rehabilitation.

Bridge preservation actions are either cyclical or conditioned-based. Cyclical activities like routine cleaning and washing slows the onset and need for condition-based actions, such as repair or replacement commonly required for bridges in poor or severe conditions. Cyclical bridge maintenance to coatings or deck surfaces protects steel beams and deck elements that will require more costly repairs if they are ignored or neglected over a long period of time.

Fig. 2: Concrete repair and corrosion mitigation of concrete atrium arches and beams at James Ensor Gallery (Ostend, Belgium)

Fig. 3: Concrete repairs and galvanic corrosion control at Historic Lester River Bridge (Duluth, MN)

Fig. 4: Anti-corrosion impregnation treatment of post-tensioning tendons at I-4 Connector (Tampa, FL)

Fig. 5: Impressed current cathodic protection of the Boerentoren (KBC Tower) in Antwerp, Belgium

Fig. 6: Electrochemical chloride extraction at the Historic Preserves Rainbow Bridge (Payette River National Scenic Byway, Idaho)

A structure in need of condition-based maintenance, however, is not automatically fatal. If the deterioration is corrosion-induced (such as structures subject to de-icing salts or seawater) in most situations, the "patient" can be nursed back to health using quality concrete repair methods in conjunction with preservation technologies such as cathodic protection, chloride extraction, and re-alkalization.

Avoidance vs Immunity

The terms "avoidance" and "immunity" are also commonly associated with sustainable construction concepts.

"Avoidance" implies actions and processes designed to prevent the structure from being exposed to harmful substances that will lead to deterioration, such as salt water or de-icing salts. Avoidance is a good strategy for the substructure of a bridge in a de-icing salt environment. If the structure is designed such that joints are eliminated or are placed away from the pier, the substructure below will be protected from leaking joints. This would effectively limit exposure of the substructure to salt water and will extend the life of the structure.

If you can't avoid the problem, then "immunity" is the better option. An immune structure has been built to withstand the harmful effects of exposure. For example, deterioration of a bridge deck exposed to de-icing salts is due to the fact that the salt eventually gets to the steel and causes corrosion. Replacing reinforcing steel with materials such as stainless steel or glass fiber rebar will eliminate the corrosion problem and extend service life. Even though the bridge deck will become contaminated with salt over time, the corrosion-resistant rebar will mitigate corrosion.

Saving Structures

Avoidance and immunity strategies work for new construction but it's a different story when it comes to extending the service life of an existing structure. What if it's already 50 years old and we want to make it last for 100 years or longer? This is where sustainability becomes more complicated. We can't change all the pre-existing conditions that affect service life. It's already built. We can't change all the materials it was built with or change the effects of exposure. So how do we manage a structure to prevent it from getting a fatal prognosis and an appointment with a demolition crew?

Call for another opinion and research other options.

Fortunately, modern concrete preservation pioneers have developed a variety of cost-effective sustainability and preservation products and services that can take a terminally-ill structure off life support and give it a clean bill of health. Techniques covered in ICRI Technical Guidelines such as 310.1R-2008[4] *Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion* and 510.1-2013[5] *Guide for Electrochemical Techniques to Mitigate the Corrosion of Steel for Reinforced Concrete Structures* are effective because they give concrete professionals options to "treat" a structure so it can stay in service and doesn't deteriorate to the point that it becomes unsafe or unusable.

Built to Last: The Confederation Bridge

The Confederation Bridge, opened in 1997, is an 8 mile (12.9 kilometer) long toll bridge that crosses ice-covered water connecting Prince Edward Island (PEI) with New Brunswick in Atlantic Canada. Several key sustainability considerations were made during the design stage and ultimately incorporated into the construction.

To minimize ice forces and facilitate the impact of ice in the strait, the bridge is designed and built on 44 massive gravity piers. The piers are spaced to meet environmental requirements with minimal disruption to the strait floor. Most of the bridge was designed at 131 ft (40 m) above the water to accommodate ship traffic, and the entire structure was prefabricated on shore to allow year-round construction.

One of the most important structural elements of the bridge is hidden. Extremely durable high-performance concrete and reinforcing steel were used throughout construction of the precast components and post-tensioning was used to tie the pier bases, shafts, and girders together into one solid, continuous structure that is designed to last 100 years until 2097, approximately two times the average lifespan for a bridge.

The bridge is a great case study of a truly successful public-private partnership and sustainable construction. It cost CAD $840 million to build and was financed entirely by the private sector using revenue from tolls, the former ferry subsidy. After 20 years, the bridge looks like new and remains a testament to engineering ingenuity.

The Future of Sustainable Construction

Despite many improvements to design and maintenance technology intended to lengthen and im-

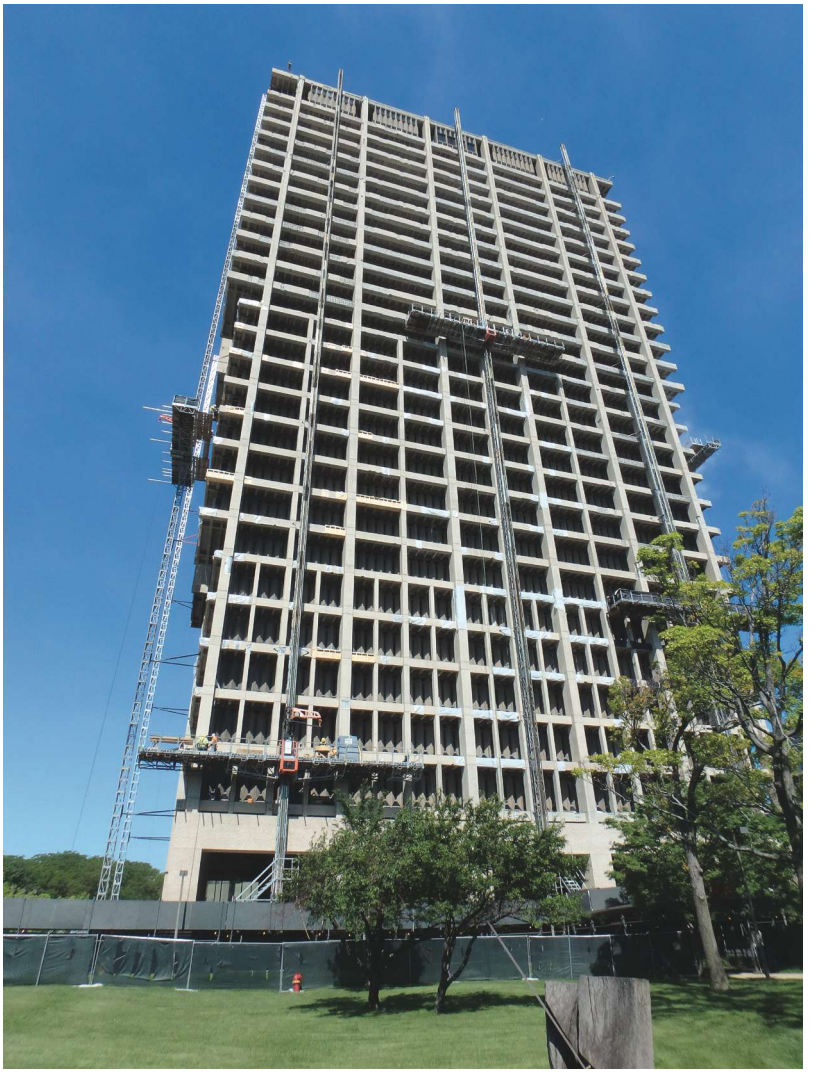

Fig. 7: Electrochemical re-alkalization of carbonated concrete for building preservation (University of Illinois)

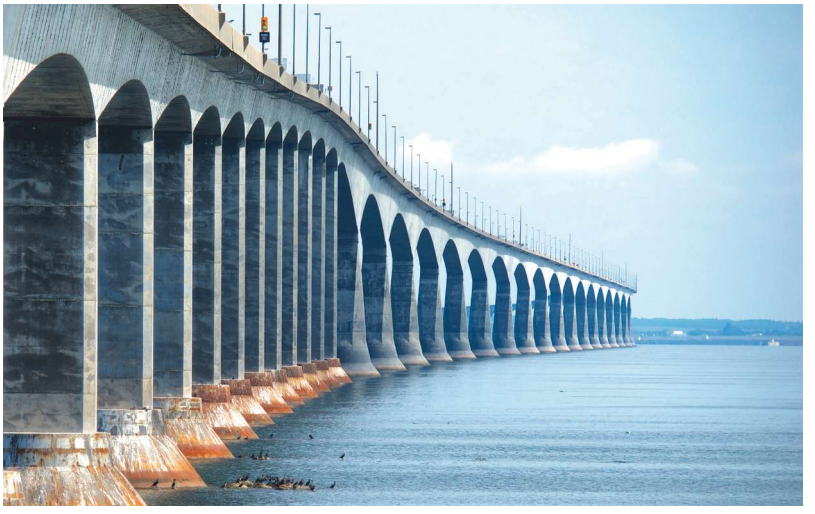

Fig. 8: Confederation Bridge (New Brunswick – Prince Edward Island, Canada)

prove the service life of new and existing structures, the construction industry still has a long way to go. For example, in Canada, the average lifespan for the five major categories of public assets are:

- Highways and roads—28.2 years;
- Bridges and overpasses—43.3 years;
- Water supply systems—36.8 years;
- Wastewater treatment facilities—28.2 years; and
- Sanitary and storm sewers—33.6 years.

As a society, we need to do a better job at addressing our infrastructure problems. About 28% of our infrastructure is more than 80 years old and in serious need of attention.[6]

The Canadian Federation of Municipalities released a report that concluded that the three levels of government must spend CAD $123 billion to fix infrastructure to avoid collapse.[7] In the United States, the most recent federal estimate puts the backlog of rehabilitation projects for the nation's bridges at US $15.3 billion.[8]

Conclusion

New technologies and materials are available to help engineers and owners build more durable structures. Maintenance and rehabilitation techniques are available to extend the service life of existing structures. This is good news for communities and citizens all over the world. By focusing on and addressing sustainability challenges today, we can create a more sustainable tomorrow. ■

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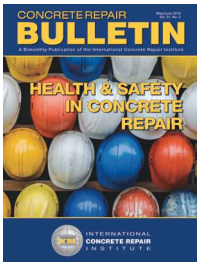

CORRECTION
May/June 2018 *Concrete Repair Bulletin*

On page 4 of the May/June 2018 *Concrete Repair Bulletin* (*CRB*), board member Paul Farrell, Region 2 Representative, was incorrectly listed as an employee of Aquafin Building Product Systems. Paul is Director of Business Development at Carolina Restoration & Waterproofing, Inc., a C.A. Lindman Company. ICRI sincerely apologizes for this error.

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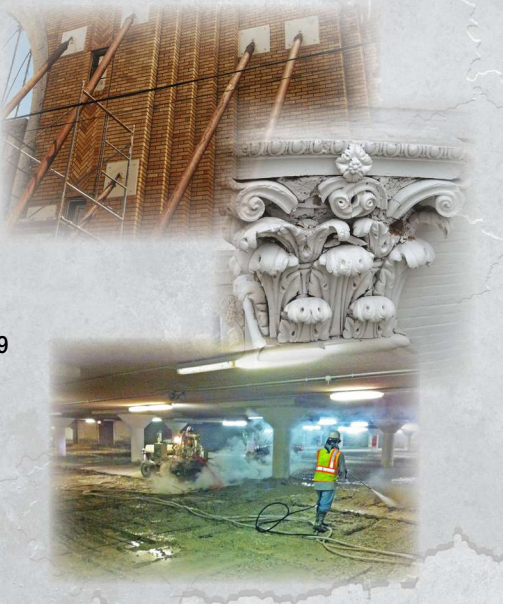

St. Paul's Union Depot: Revitalization of a Historic Concrete Train Depot

BY ARNE JOHNSON, JONAH KURTH AND KEVIN MICHOLS

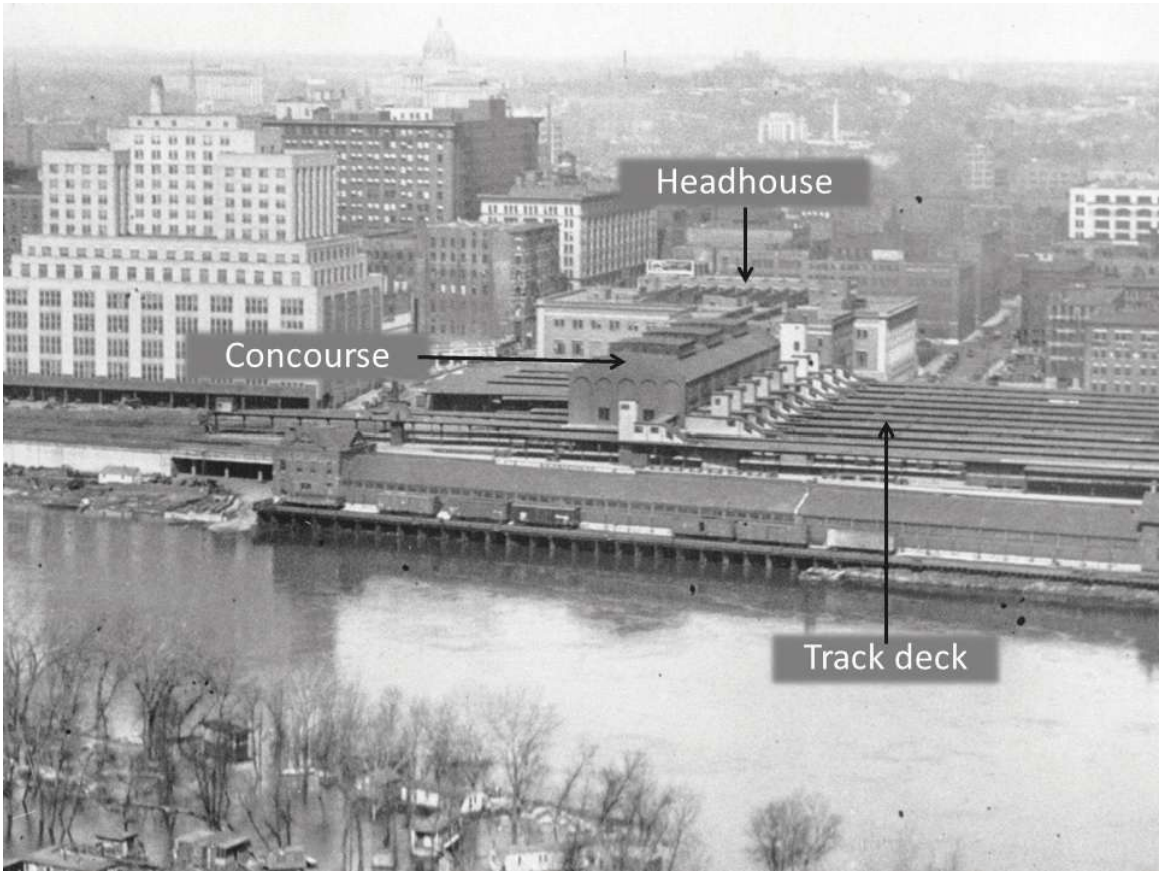

Fig. 1: Historic photograph of Union Depot, looking north, provided by Ramsey County Historical Society

The historic Union Depot railroad terminal, constructed circa 1925 along the Mississippi River in St. Paul, Minnesota, was a very active train station through the mid-1960s. The head house and elevated track deck structure (Fig. 1), which occupied 6 acres (2.4 hectare) and accommodated 20 railroad tracks, served 20,000 passengers daily at its peak in the 1920s. Over the decades, though, passenger rail service declined and then ceased in 1971. In the decades following, the Depot was converted into a postal distribution center and most of the railroad tracks, platforms, and ballast on the topside were replaced with soil fill and paving, and the lower level baggage handling service area was converted into a parking facility.

In 2009, the Ramsey County Regional Railroad Authority acquired the Depot and embarked on a US $240 million rehabilitation to turn the facility into a modern multi-modal transportation hub. Completed in 2012, the revitalized Depot and surrounding area accommodates passenger rail, local light rail, buses, taxis, and bicycles, and was designed with the potential for future high-speed rail service.

Track Deck Structure

The Depot's sprawling track deck includes approximately 600 21-ft (6.4 m) square bays of reinforced concrete superstructure, with 21 in (533 mm) thick, reinforced concrete slabs spanning between circular concrete columns and perimeter walls. The columns and walls are, in turn, supported on below-grade concrete pile caps and approximately 9,000 untreated timber piles, typically occurring in 14-pile groups per pile cap.

The small portion of the original drawings that was found provided some indication of typical reinforcing steel layout, pile

cap and timber pile layouts, and limited construction details. According to journal articles published during original construction, the structure was designed for Cooper E-60 standard train loading with 25% added for impact. The deck was an early two-way slab designed according to the "Chicago ruling using a flat slab principle," and used both orthogonally and diagonally-oriented bands of reinforcing to carry the load.

The Challenge

Approximately 90 years of exposure to a harsh northern climate had taken their toll on the track deck superstructure. The concrete structure exhibited advanced deterioration due to leakage, freeze-thaw cycles and corrosion. Loss of timber pile integrity was also suspected because of obvious signs of settlement and structural cracking in several areas of the track deck. Feasibility of the rehabilitation hinged on whether the existing structure had sufficient remaining capacity, or could be effectively and practically repaired, to reliably support the anticipated loads of the rehabilitated Depot for the desired 50-year service life extension.

Assessment of Timber Pile Foundations

Deterioration of timber piles is typically caused by brown- and white-rot fungi (the most common types of decay observed in above-grade structures) and soft-rot fungi related to molds. Brown and white rot require high wood moisture content (typically above 20%) and sufficient oxygen, so they typically do not occur in wood that is submerged in water or buried deep below grade. However, they can exhibit rapid growth and thus are typically the more destructive forms of decay in piles near or above the groundwater line. Soft-rot can tolerate high moisture levels and requires less oxygen, so it can be significant in wood that is submerged, very wet, or below-grade. Slow-growing bacterial decay can also occur in wood that is submerged; and insect attack (e.g., termites) is prominent above groundwater in warmer climates.

Geotechnical surveys were conducted to define the soil characteristics and the position of the water table relative to the tops of the timber piles. Surveys showed the tops of all of the piles were likely above permanent groundwater and thus vulnerable to decay; however, due to the downward slope of the water table toward the river, only the top 2 ft (0.6 m) of the piles were above groundwater at the north side of the site, whereas the top 12 ft (3.7 m) of the piles were above groundwater at the south side (closest the river). Soil characteristics were variable but predominantly granular (sandy) toward the south, with sandy clays toward the north. Decay of timber piles is more likely in granular soils than in cohesive soils because of the potential for increased moisture fluctuation and greater oxygen concentration. These site conditions suggested that the piles to the south were the most vulnerable.

A field investigation exposed 54 timber piles through exploratory test pits (Fig. 2), or about one-half of 1% of the approximately 9,000 timber piles. Locations of the test pits were guided by a comprehensive visual inspection and elevation survey across the underside of the track deck to locate any structural distress or unusual gradients in the deck elevation that might be indicative of timber pile degradation below. Within each test pit, conditions of the pile caps and timber piles were documented, soil type was noted, in-situ tests were conducted on the piles, and timber samples including core samples and full-diameter sections representing a range of conditions were removed for subsequent laboratory testing. In addition, in-situ load testing of two representative piles that did not exhibit significant wood decay was conducted.

Considering the small sample size of exposed piles and the variability in conditions identified, Monte Carlo statistical simulations were performed considering pile diameter, wood species, and percent of cross sectional area loss due to decay to estimate the probability that any pile cap on the site had a certain vertical-load-carrying ability. The simulations predicted that only about 30% of the pile caps could reliably support heavy Class 1 rail loading now, and only about 5% would be able to do so after 50 years (considering a rough extrapolation of future pile deterioration). On the other hand, roughly 80% of the pile caps should be able to reliably support the light rail and bus loading in 50 years.

Based on the results of the investigation and analysis, it was concluded that the timber pile foundations supporting the southern third of the track deck should not be relied upon to support the heavy Class 1 rail loads programmed for that portion of the rehabilitated facility. In this area, the majority of the deck and foundations were demolished and reconstructed to replicate the original historic appearance. For the northern two-thirds of the track deck where the pile conditions were better, it was concluded that the existing foundation should have sufficient capacity to support the anticipated light rail, bus and vehicle loads for the next 50 years. Accordingly, the existing concrete structure was repaired and the existing timber pile foundations were left undisturbed to support the rehabilitated facility.

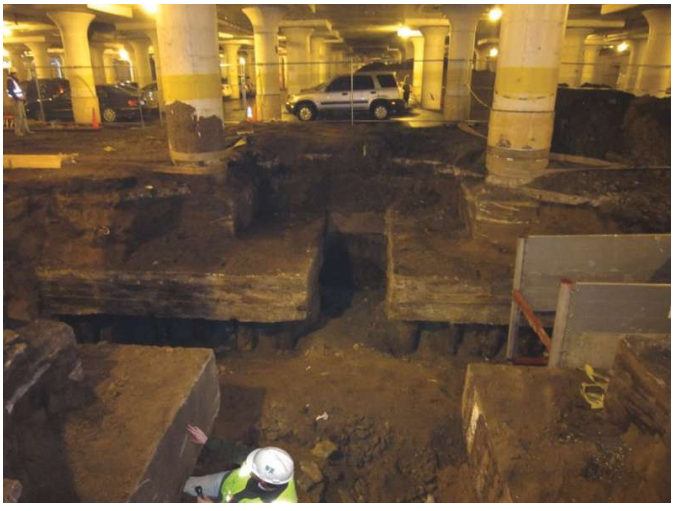

Fig. 2: Test pit exposing concrete pile caps and timber piles

Fig. 3: Representative conditions at underside of track deck before rehabilitation

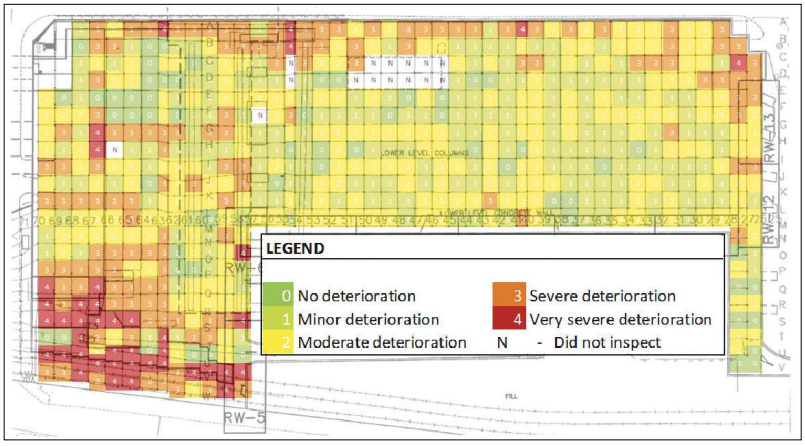

Fig. 4: Visual condition survey ratings

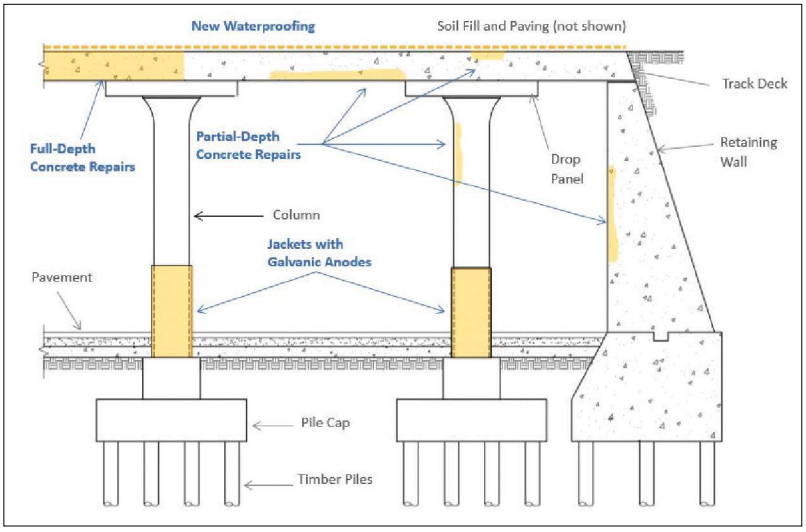

Fig. 5: Typical section through track deck structure showing concrete repair scope

Assessment of Concrete Superstructure

The existing approximately 260,000 sf (24,155 sm) concrete superstructure was assessed through a combination of visual inspection of the entire structure, detailed examination and field testing at representative study areas, laboratory testing of material samples, and structural analysis. The concrete superstructure exhibited deteriorated conditions (Fig. 3) in varying degrees, including:

- Cracks in the track deck and retaining walls, some with efflorescence deposits and leakage;
- Delamination and spalling of original concrete at the deck underside, columns, and walls;
- Delamination and spalling of 20-year old shotcrete repairs at the deck underside and walls;
- Exposed and corroded reinforcing steel at most spalls;
- Scaling and disintegration of concrete surfaces, especially at deck edges and column bases; and
- Water staining, efflorescence, and leakage at drains and original construction joints in the deck.

To efficiently assess the overall condition of the large-area track deck, visual observations of conditions at the underside of every bay were documented in detail, and a visual condition rating ranging from 0 to 4 was assigned to each bay based on the types and quantity of deterioration noted. The visual inspection data were then used to calculate the quantity and frequency of the deterioration conditions. Using these data, an algorithm was developed to calculate a numerical condition rating ranging from 0 to 100 for each bay. The calculated and visual field ratings showed the same overall pattern of deterioration (Fig. 4) and provided a basis to select representative bays for in-depth investigation, as well as a means to infer the condition of the top of the deck, which was covered by 3 ft (0.9 m) of fill and pavement.

Four deck bays and two perimeter wall bays that represented the range of existing conditions were selected for in-depth study. Paving and soil fill were removed to expose the top side of the deck, and close-up visual examination, hammer sounding, reinforcing steel surveys, localized concrete excavation, half-cell potential testing, and core sample removal were performed. Hammer sounding detected delaminated areas that were not identified by visual survey. Previous shotcrete repairs, while visually appearing intact, were typically delaminated. Additional bays beyond the study

areas were sounded to more accurately estimate the repair quantities. All columns were visually inspected and six different types of steel or concrete jackets were identified on approximately 70% of the column bases. Representative jackets were removed, typically exposing deteriorated concrete and corroded column reinforcement.

Sixty concrete cores were subjected to laboratory testing, including petrographic examinations, carbonation depth testing, chloride ion profiling, and compressive strength testing, in order to determine deterioration mechanisms and long-term durability potential of the concrete. Mechanical properties of the reinforcing steel were evaluated by metallurgical testing of ten samples.

Structural analyses of representative portions of the existing superstructure were conducted using material properties determined by laboratory testing to evaluate the structure's ability to support the anticipated design loads. Load rating was performed according to the *AREMA Manual for Railway Engineering* published by the American Railway Engineering and Maintenance-of-Way Association (www.arema.org) and general industry practice. The analyses indicated that the track deck is capable of supporting the light rail and bus loading, as well as heavy rail up to Cooper E-40 design load; more refined analysis would likely justify locally heavier rail loads up to Cooper E-60.

Concrete Superstructure Repairs

The investigation determined that the primary causes of the concrete deterioration were long-term water leakage through cracks and joints, localized chloride-induced corrosion of reinforcing steel from exposure to deicing salts, localized carbonation-induced corrosion, and freezing and thawing of saturated concrete, which is not air-entrained. While the concrete deterioration was widespread and advanced in some areas, the investigation concluded that the structure could be repaired. The driving forces of future deterioration are corrosion of the reinforcement and freeze-thaw damage of the concrete, both of which require moisture and are accelerated by chlorides, so the repair strategies included protecting the concrete against water and chloride ingress (Fig. 5).

Partial-depth concrete repairs extending beyond the near surface reinforcing steel mat were specified for the deck underside and perimeter walls (Fig. 6). Given the volume of concrete removal required, hydrodemolition was utilized and proved to be cost-effective for repair area preparation. Shotcrete was utilized for overhead and vertical concrete repairs and included a form-board finish

Fig. 6: Repairs in progress

Fig. 7: Column jacket repairs during construction (left) and five years after rehabilitation (right)

to match existing. Full-depth repairs were necessary along expansion joints and around drains. For the deck topside, to mitigate water and deicing salt infiltration, heavy duty waterproofing systems, expansion joint seals, crack and construction joint sealing, and improved drainage were specified. For the deck underside, a breathable coating was utilized to slow future carbonation. These repairs were deemed sufficient for the 50-year service life extension, with recognition that some localized concrete repairs should be anticipated over time.

Because of advanced corrosion and chloride contamination at the column bases down to the pile caps, as well as the difficulty in making these repairs in the future with the facility in service, column repair included removing all existing jackets and concrete cover to the vertical reinforcing bars, installing distributed galvanic anodes for corrosion control, and encapsulating the repair with new, fully grouted steel jackets (Fig. 7). The new jackets are a

barrier against additional chlorides, and the galvanic anodes mitigate corrosion in the underlying already-chloride-contaminated concrete.

Accurately estimating concrete repair quantities before construction can be challenging, especially for very large structures. The comprehensive visual inspection data in combination with the condition ratings for each bay of the deck underside were extremely helpful in this project. Repair quantities were developed using calculations that considered the average area of deterioration for each condition rating, the area of existing shotcrete patches (all of which were recommended for replacement), and growth factors to account for actual repair areas being larger than the surveyed areas. Final repair quantities logged during construction were very close to the estimated quantities.

Summary

Rehabilitation of the historic railroad terminal hinged on whether the 90-year-old structure with widespread and locally severe deterioration had sufficient remaining capacity, or if the structure could be effectively and practically repaired to support the anticipated loads of the rehabilitated facility. The unique engineering approach used to assess the concrete superstructure and timber pile foundations of this very large facility was sufficiently thorough while still being cost-effective and efficient. Comprehensive inspections followed by targeted testing showed the extent and causes of deterioration, allowed the development of repairs to address the underlying deterioration mechanisms, and provided a means of accurately estimating concrete repair quantities. The resulting information substantiated the ability for most of the original structure to be retained and effectively repaired for the desired 50-year service life. The extensive rehabilitation was completed in just 23 months and the revitalized Depot opened in December 2012 (Fig. 8 and 9). A walk-through of the structure in 2018 confirmed overall good performance of the concrete repairs to the track deck, with no new signs of structural settlement or unexpected deterioration. ■

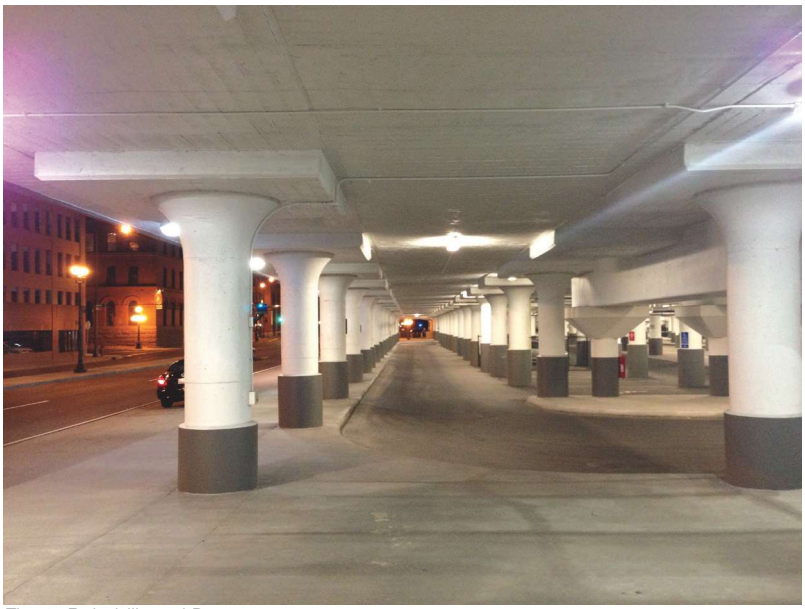

Fig. 8: Rehabilitated Depot structure

Fig. 9: Rehabilitated Depot entrance

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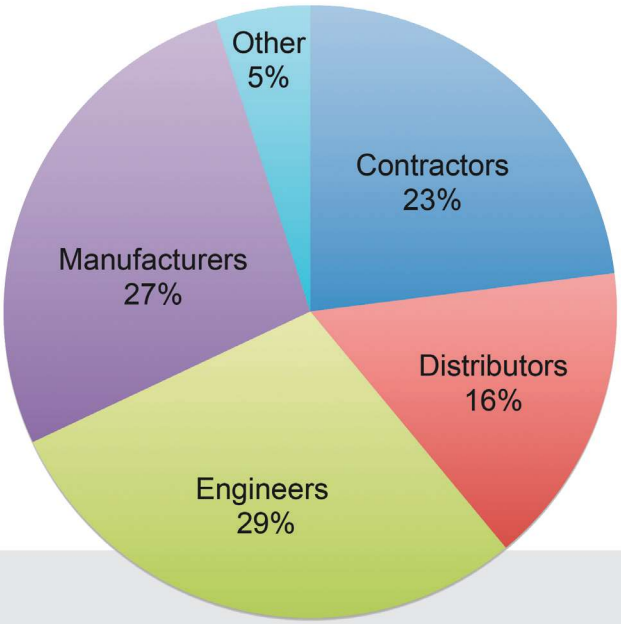

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Nondestructive Testing Saves Tenant Build-out Schedule

BY JASON YATES AND GERALD DALRYMPLE

Fig. 1: Fourteen story Class A commercial building after floor additions

The loss of rental income has a major financial impact on the operations of commercial real estate. Rental income is based on operable unit usage; therefore, minimizing new tenant fit-out schedules are crucial in the rental income equation. The following is a representation of a tenant fit-out schedule for a commercial property in Rosslyn, Virginia, that was jeopardized when significant spalling and reinforcement corrosion in the floor slab of the space was uncovered during tenant renovations to approximately 18,000 sf (1672 sm) of Class A rental space.

The building (Fig. 1) was originally constructed with twelve floors; an additional two floors were added to the building in 1995. A new tenant lease was executed over 20 years after the addition and completion of the 13th and 14th floors. Tenant renovations included complete gutting and reconstruction of the interior floor space and installation of private internal stairs to connect the offices that were to be occupied by the tenant of the two upper floors.

During removal of the floor finishes, significant areas of concrete spalling and delamination as well as advanced corrosion of the structural concrete slab reinforcing steel was found at the 13th floor (Fig. 2). This prompted concerns of widespread corrosion damage to the 13th floor structural slab, which was the original roof slab prior to the addition of the new floors.

Developing a testing protocol to locate the deterioration required consideration of the existing slab construction. For example, the existing +/- 12 in (305 mm) thick slab was covered with a cementitious floor leveling overlay, and at some locations two layers had been installed (Fig. 3). These overlays were installed during construction of the additional two floors to level the surface of the 13th floor which was originally constructed with slope to manage water drainage when it served as the original roof slab.

The overlays made access to the structural slab deck surface impractical. As such, normal sounding methods for identifying delaminated concrete at the underlying structural slab deck surface could not be used. An evaluation method was needed that could test through the layers of materials to locate areas of deterioration in the structural slab. Based on this need, impact-echo testing[1] was selected for the project.

Impact-Echo Testing

The number and varying thicknesses of the installed overlays made it impossible to relate test results with actual conditions of the un-

derlying structural slab if testing was performed on the slab walking surface. To overcome this obstacle, impact-echo testing was performed on the bottom of the slab to identify delaminations in the top surface of the slab. The testing was executed in a grid pattern of approximately 2 ft (0.6 m). To calibrate the testing equipment and verify test results, cores were extracted from the top surface and the delamination locations within the cores were then correlated with the testing data gathered at that location.

By testing the bottom of the slab, the influence of the overlays was avoided, and the thickness of the structural slab could easily be determined at the test location. The top reinforcement layer had concrete cover of approximately 1½ in (38 mm). Thus, when corrosion of the reinforcement progressed to the point where delaminations occurred at the level of the reinforcing steel, the apparent thickness of the slab indicated through testing would be less than the non-delaminated slab thickness (Fig. 4). The areas of apparent reduced slab thickness were mapped on floor plan drawings and the total area of delaminations was estimated. This permitted repairs to be performed at select areas in lieu of full-scale removal of the overlays to permit identification of deterioration in the underlying structural slab. The impact-echo testing indicated that approximately 25% of the floor area required repair, thus saving the removal of 75% of the existing overlays, which would have required placement to provide a level floor surface.

Impact-Echo Test Method Explained

Impact-echo is a successful testing method for determining the thicknesses of concrete elements and the depth to anomalies in concrete thickness by inducing and reading the return of a compression wave in the concrete. The testing can then be analyzed using the following equation:

- $C_P = 2f_T T$, where
  - C_p = Wave speed through concrete at the test location

- To determine the thickness of the slab from signals throughout the project area, it is required to first determine the wave speed for the project concrete using calibration signals at areas of known thickness.

- Typically, the wave speed is considered to vary between 3,600 and 4,200 meters per second (m/s), or 11,811 to 13,780 ft/sec; but is often approximately 4,000 m/s (13,123 ft/sec).
  - f_T = Frequency at the test location
  - T = Thickness at the test location

Fig. 2: Concrete slab spalling and reinforcing steel corrosion exposed during renovations

Fig. 3: Overlays of varying thickness covering the top surface of the structural slab

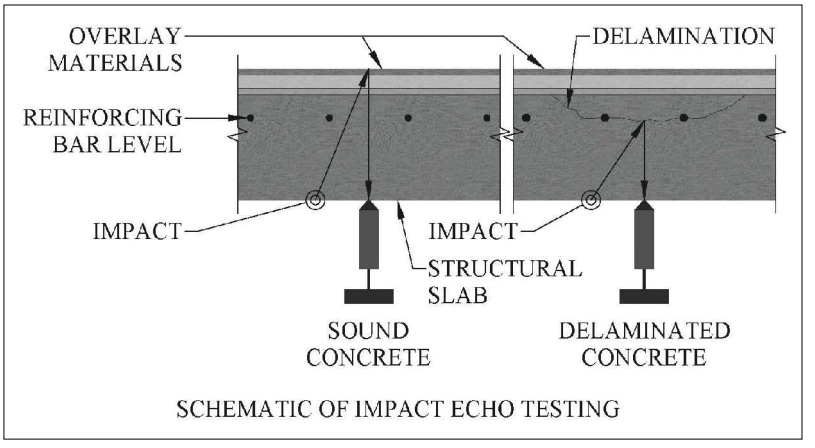


Fig. 4: Schematic of impact-echo testing

Fig. 5: Core condition at Location 1

Fig. 6: Core condition at Location 2

Fig. 7: Core condition at Location 3

Field Calibration Testing

Impact-echo tests were performed near four columns to non-destructively assess the slab conditions at these locations. Cores were taken at each of these locations as a means of verifying and calibrating the impact echo testing procedure. The findings from these cores were as follows:

- Location 1 (Fig. 5)
  - 2 ½ in (64 mm) thick patching material on top of base concrete
  - Approximately 12⅜ in (314 mm) total thickness
- Location 2 (Fig. 6)
  - ½ in (13 mm) leveling overlay and 1¼ in (32 mm) thick patching on base concrete
  - Approximately 13 in (330 mm) total thickness
- Location 3 (Fig. 7)
  - ¾ in (19 mm) thick leveling overlay on base concrete
  - Approximately 13 in (330 mm) total thickness
- Location 4 (Fig. 8)
  - ½ in (13 mm) thick leveling overlay on base concrete
  - Approximately 13¼ in (337 mm) total thickness

In general, the full thickness of the slab was found to have been made up of a combination of three (3) material layers as shown in Figure 9.

Based on the variety of material layers identified in the slab thickness through extraction of eight (8) cores, it was found that the actual average calculated wave speed was 2,800 m/s (9186 ft/sec), which was much lower than the typical wave speed range.

Site Testing

Using the calculated average wave speed of 2,800 m/s (9186 ft/sec), impact-echo testing was performed at random test locations. The results of this testing indicated that, while hidden from view below the topping materials, there were numerous areas where the concrete slab was delaminated on the top surface. Testing was subjected to actual verification at several locations where sections of overlay material were removed and the surfaces sounded to define deteriorated concrete. The sounding survey results indicated that the impact-echo testing accurately defined deteriorated concrete areas under the overlays.

Conclusion

Based on the accuracy indicated at the selected test areas, impact-echo testing continued on the project and only areas identified as deteriorated were scheduled for repairs. The use of the impact-echo testing avoided several months of delay in tenant fit-out completion and delay of tenant occupancy that would have had a significant rental income impact for the building owner. ■

References

1. ASTM C1383, *Standard Test Method for Measuring the P-Wave Speed and the Thickness of Concrete Plates Using the Impact-Echo Method*, ASTM International, West Conshohocken, PA, 2015, 11 pp.

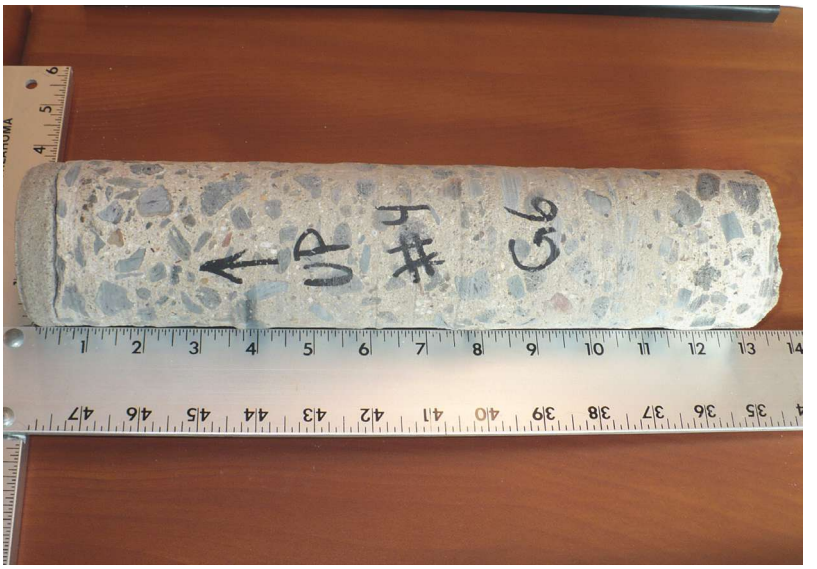


Fig. 8: Core condition at Location 4

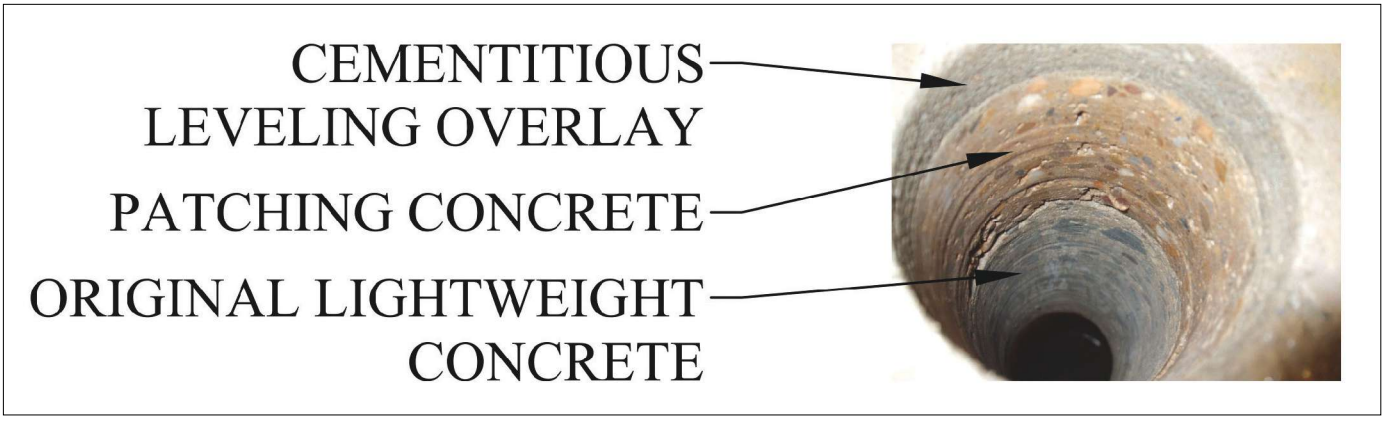
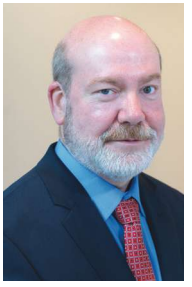


Fig. 9: Existing material layering over structural slab

Jason S. Yates, PE, *joined WDP & Associates, Inc. in 1995 and has 24 years of experience. He is responsible for performing building envelope assessments and repairs, structural engineering analysis, field and laboratory investigative testing, compilation and analysis of field and office-generated data, and the generation of reports of findings. Jason has experience in the operations of destructive and nondestructive methods used in evaluating concrete, masonry specimens, water penetration and structures. He is also experienced in construction quality control field testing and inspection procedures performed during rehabilitation programs for structures.*



Gerald A. Dalrymple, PE *has over 30 years of experience in the industry and cofounded WDP & Associates in July 1995. He is involved with a wide variety of building envelope disciplines including failure investigations, rehabilitation of existing structures, development of restoration design specifications, construction management and inspection, and litigation support. As a nationally recognized expert in his field, Gerald has been involved in numerous high-profile projects throughout his career and has served a variety of clients including contractors, architects, engineers, government agencies, school systems, and private sector clients. In 2010, he received The Masonry Society's TMS Service Award and previously received a Facilities Management Recognition Award for "exemplary service during reconstruction of balconies at the historic Pavilions in Thomas Jefferson's Academic Village" by the University of Virginia Facilities Management office.*

THE 2018 ICRI SPRING CONVENTION

Scenes from San Francisco

BY DALE REGNIER

The sparkling city by the bay served as the backdrop for ICRI's 2018 Spring Convention in San Francisco, California. Dedicated veteran ICRI members worked alongside the many new faces seen at this convention to push forward significant committee work. Attendees also enjoyed engaging technical sessions, a nice mix of new and perennial exhibitors, and saw it all come together with the Institute's annual recognition luncheon. This three-day event, held April 11 through 13 at the InterContinental Mark Hopkins Hotel, was more than just another ICRI Convention; it helped prove once again that everyone is welcome at ICRI and if you are willing, there is plenty for you to do.

The convention began on Wednesday morning with our "Visit the Exhibits" continental breakfast, where our exhibitors showed off their best and brightest for the morning crowd. The space at this event included 34 exhibitors willing to share their innovations. The theme of this convention, "Seismic Solutions," allowed for members of the Technical Activities Committee to gather a selection of industry experts to present 20 sessions that were able to address issues like seismic retrofitting techniques, strengthening composite rebar advancements, and new corrosion protection systems. The spring schedule allows attendees to attend the technical presentations in the morning of the first day with no other scheduled meetings to compete for their attention.

With the help of the Concrete Preservation Institute, attendees had the unique opportunity to tour the Alcatraz Concrete Restoration project. A sold-out crowd was able to take a tour that most others are not able to take, including some in-depth information on restoration projects that only ICRI members could truly appreciate.

Much of what makes ICRI as strong as it is comes from the hard work of our technical committees. We broaden our knowledge base and expand the industry by working together in these meetings. All the ICRI products come out of the collaboration of our members in these committees. Contractors, engineers and materials suppliers - experienced and new to the industry - all bring their unique perspectives to the table. If you want to know what is happening at any time with any of our committees, you are encouraged to drop by the Technical Committee page of the ICRI website to view a description of what is happening right now.

The highlight of the Spring Convention is the Annual Recognition Luncheon. This year's lunch presentation began with the unveiling the new ICRI Compensation and Benefits Survey results. This is the first time compensation and benefits have been studied for the concrete repair industry. ICRI President Ralph Jones took time during this event to thank the board members, committee members, chairs and TAC members who have ended their terms of service in the past year. After a presentation on the activities of the Concrete Preservation Institute, ICRI honored its newest Fellows, Mark DeStefano and Ashok Kakade. ICRI Chapters Committee Chair Michelle Nobel then handed out the 2017 Chapter Awards, honoring the great work of ICRI's chapters. Out of the 25 entries, the esteemed Chapter of the Year Award was given to the Great Plains Chapter and Gulf South won Most Improved Chapter.

Thursday's busy schedule concluded with a special evening at the Fairmont Hotel where attendees were able to Celebrate San Francisco. The convention closed Friday afternoon following the final "Visit the Exhibits" continental breakfast as well as a full day devoted to committee meetings. If you are not attending ICRI Conventions, you are definitely missing out on some interesting activities and entertaining networking opportunities. The 2018 ICRI Fall Convention, *Resiliency: Above and Beyond Concrete Repair*, will be held at the Omaha Marriott Downtown at the Capitol District, Omaha, Nebraska, November 7-9, 2018. Make plans to attend now so you can witness firsthand the awarding of this year's Project of the Year at the 2018 Project Awards dinner and celebration. Members are getting things done at ICRI and they invite you to get involved. Get involved a little, or get involved a lot. It is up to you. Make the most of your membership and come to a convention. ■

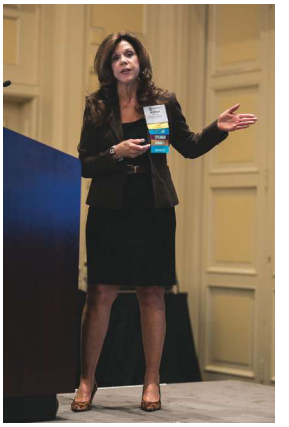
SCENES FROM SAN FRANCISCO

Members and guests mingle at the Welcome Reception on Wednesday

Every convention starts with reconnecting with friends and colleagues

(left to right) Suzie Edelson, Keith Harrison and John McDougall get a chance to reconnect

Conventions provide the perfect opportunity for students to mix and mingle with ICRI members



Presenting during the Thursday afternoon technical sessions is ICRI Past President Monica Rourke

Attendees always enjoy the opportunity to see what is new from each of the exhibitors

Attendees (from left to right) Michael Jalbert, Pierre Hebert, and Johnnie Rice enjoying the Welcome Reception

SCENES FROM SAN FRANCISCO

Each convention includes technical sessions where members learn about the newest techniques and most advanced materials.

The Spring Convention featured 20 technical presentations on the Seismic Solutions theme

Attendees could earn up to 12 professional development hours at this convention

2017 ICRI President Brian Daley helped kick off the Recognition Lunch

ICRI Executive Director Mike Levin joined Brian Daley on stage at the Recognition Lunch to announce the availability of the 2018 ICRI Compensation and Benefits Survey

Recognition Lunch on Thursday afternoon

2018 ICRI President Ralph Jones (right) thanked Brian Daley (left) for his service as 2017 ICRI President

SCENES FROM SAN FRANCISCO

Tanya Komas, Concrete Preservation Institute, explained CPI's mission of training and inspiring military service members, connecting them to civilian careers in concrete, construction, and infrastructure while preserving national landmarks

ICRI President Ralph Jones (at the podium) introduced the Executive Committee which includes (left to right) Mark LeMay, Elena Kessi and Chris Lippmann

Committee meetings are where the real work of ICRI gets done

Most ICRI committees are open to input from any ICRI member. Check out what is happening by visiting the ICRI website

ICRI Celebrated San Francisco in the ballroom at the iconic Fairmont Hotel

Three of ICRI's most welcoming members - (left to right) Tom Ouska, Rick Edelson, and Peter Golter - look forward to seeing you at the next ICRI event. Look for them, they look forward to meeting you!

INDUSTRYNEWS

SIMPSON STRONG-TIE SPONSORS ICC'S BUILDING SAFETY MONTH IN MAY

Simpson Strong-Tie, the leader in engineered structural connectors and building solutions, joined other industry associations and organizations in supporting the International Code Council's (ICC) 2018 Building Safety Month in May. As co-sponsor of one of the campaign's theme weeks, Simpson Strong-Tie encouraged the industry and the general public to learn more about the role of building codes, officials and other professionals in making buildings, homes and decks safe and strong.

Building Safety Month is a public awareness campaign conducted by the ICC each May to help individuals, families and businesses understand what it takes to create safe and sustainable structures. This year's campaign theme was "Building Codes Save Lives." The five-week campaign spotlights specific aspects of building safety through weekly topics—"Partnering with Code Officials to Build Stronger, Safer Communities," "Advancing Resilient Communities Through Science & Technology," "Protecting Communities from Disasters," "Safeguarding Our Water" and "Improving Education & Training Standards for a Safer Tomorrow." The overall goal is to drive home the importance of adopting modern, regularly updated building codes; implementing a strong and efficient system of code enforcement; and developing a well-trained, professional workforce to maintain the system. To learn more about the campaign and how to get involved, visit buildingsafetymonth.org.

As a sponsor, Simpson Strong-Tie has several resources that help support the initiatives of Building Safety Month, including educational materials for designing and building homes and other structures that can resist earthquakes and high winds, as well as for constructing and retrofitting code-compliant wood decks. These resources can be found on the Simpson Strong-Tie homeowner website, safestronghome.com. Additional information for professionals is available at strongtie.com/highwind and strongtie.com/softstory.

SIMPSON STRONG-TIE SUPPORTS HABITAT'S WOMEN'S LEADERSHIP BUILD

Simpson Strong-Tie sponsored the Habitat for Humanity East Bay/Silicon Valley Women's Leadership Build on Friday, May 18. Simpson Strong-Tie CEO Karen Colonias participated in the build and spoke as part of a panel of women executives in the Bay Area.

The Women's Leadership Build empowers women leaders from local business and civic communities to make a concrete difference in the housing crisis by building affordable housing. The build took place in Central Commons, Habitat for Humanity East Bay/Silicon Valley's 30-home development in Fremont. Simpson Strong-Tie donated $10,000, and other women leaders in the company (including its VP of Human Resources and its director of Global Quality Systems) joined Karen Colonias at the build.

Simpson Strong-Tie has supported Habitat for Humanity for more than two decades and has been a national sponsor since 2007, donating more than $5 million in cash and products, including the structural framing hardware (connectors and fasteners) and reinforced shear walls used in new home construction. The company also supports Habitat for Humanity's annual Jimmy and Rosalynn Carter Work Project and Habitat Strong, a program for building more resilient homes.

CHANEY'S 19TH ANNUAL GOLF TOURNAMENT RAISES OVER $55,000 TO SUPPORT SUBSTANCE ABUSE AND CANCER RESEARCH

Chaney Enterprises, a ready-mix concrete, aggregates and construction supplies provider, raised over $55,000 for the American Cancer Society and substance abuse and cancer research at its 19th Annual Babe & Dick Chaney Memorial Golf Tournament.

The sold-out tournament, held at Old South Country Club in Lothian, Md., included a putting contest to kick off the day and was followed by the golf tournament. Attendees then stayed for dinner and awards at the Club. Chaney also debuted its new concrete mixer truck with the company's anti-opioid messaging.

Sponsors of the 19th Annual Babe & Dick Memorial Golf Tournament included Aggregate Industries, Alban Cat, Baltimore Potomac Truck Centers, CohnReznick LLP, Columbia Rubber Corp., Community Bank of the Chesapeake, Dewberry, GCP Applied Technologies, Greenberg Gibbons, Hogan Companies, Howard Bank, Lehigh Cement Company, Lennar, Luck Stone, Meinhardt Properties, Mellott Company, The Pete Store, PNC Bank, PPC Lubricants, RBC Wealth Management, Reliable Contracting Company, Inc., Rhinehart Railroad Construction, Inc., Ribera Development, The SEFA Group, Silver Companies, St. John Properties, Inc., Soltesz, Inc., and Vulcan Materials Company.

The Chaney Foundation, the philanthropic arm of Chaney Enterprises, seeks to make a concrete contribution to positively affect the well-bring of the communities it serves by investing human and financial resources. Grants are given in the communities that align with the company's market footprint and focuses on arts and culture, education, the environment, health, workforce development, and safe workplace.

QUIKRETE® SHOTCRETE HELPS GIVE HISTORIC BRIDGE NEW LIFE

Award-Winning Rehabilitation Gets Custom Treatment with Color and Corrosion Inhibitor

Opened in 1913 with claims as the world's largest concrete bridge, the Albertus L. Meyers Bridge in Allentown, Penn., underwent extensive rehabilitation highlighted by pier reconstruction using QUIKRETE® Shotcrete MS. Recommended and performed by Mar-Allen Concrete Products, Inc., the dry-process shotcrete application used to repair the piers improved the appearance, durability and overall structural integrity of the bridge while maintaining its status on the National Register of Historic Places.

Built with nearly 30,000 cubic yards of reinforced concrete in an open-spandrel

arch design, the Albertus L. Meyers Bridge is nearly 1,800 feet long and 50 feet wide. During the past century, the bridge has received multiple improvements to ensure safe travel over the Little Lehigh Creek between Allentown's Center City and South Side. The Pennsylvania Department of Transportation (PennDOT) enlisted IEW Construction Group for the latest rehabilitation, a $20 million initiative completed in 2016 that included a new bridge deck, alcoves, roadway approaches, lights, sidewalks, curbing, fences and signs.

Arguably the most challenging aspect of project was reconstructing the deteriorated concrete piers, which required ACI Certified Nozzlemen from Mar-Allen Concrete Products, Inc. to make 60 percent of the repairs overhead while elevated off the ground up to 120 feet, often in high winds. In addition, the QUIKRETE® Shotcrete MS was enhanced with a corrosion inhibitor and fibers to help meet strength and bond specifications, and it was customized to match the bridge's original color as approved by the Pennsylvania Historic and Museum Commission.

Nearly 50,000 pounds of shotcrete was spray-applied over dampened repair areas prepared by removing unsound concrete with a pneumatic hammer, reinforcing usable rebar by grit blasting and replacing unsalvageable rebar. The repair depths ranged from three inches to four feet and galvanized mesh was installed for added support as necessary. A spray cure was applied to help prevent plastic shrinkage cracking as a final step in the process. Throughout the rehabilitation, large burlap curtains hung from cables covering the bridge to protect outside property from dust and to help manage the sun's impact on the curing process.

The decision to use a dry-process shotcrete application rather than the initially specified form-and-pour approach saved time and money in preserving an historic landmark with decades of service life remaining. The Albertus L. Meyers Bridge rehabilitation earned honorable mention recognition in the 2017 American Shotcrete Association Outstanding Project Awards.

MCCANN INDUSTRIES OPENS NEW LOCATIONS IN MICHIGAN AND INDIANA

Both Facilities Offer CASE Construction Equipment with Parts and Service

McCann Industries, Inc. is pleased to announce that their territory as the exclusive full line dealer for CASE Construction Equipment has been expanded in both Indiana and Michigan. The company is opening a new branch in each state to provide a reliable option for the construction industry. Both locations will offer the full line of CASE Construction Equipment for sale or rent, plus parts and service and a line of construction tools. The Indiana location is in Mishawaka, just east of South Bend, and the Michigan location is in Dorr, a few miles south of Grand Rapids.

In addition to offering the full line of CASE Construction equipment, McCann stocks an extensive inventory of tools and light

equipment to assure contractors have the products they need to get their projects done on time and on budget. Certified technicians are available for routine maintenance and emergency repairs either in the field or in the shop for any make or model of equipment.

The new locations are located at:

Michigan	Indiana
3260 142nd Ave	14077 Esther Ave
Dorr, MI 49323	Mishawaka, IN 46545
(616) 371-7250	(574) 406-6800

AQUAJET SYSTEMS INTRODUCES SPECIALIZED TRAINING ACADEMY TO NORTH AMERICA

Aquajet Systems AB, a global leader in hydrodemolition machine manufacturing, provides North American operators advanced training through its new Aquajet Academy. The Academy's Six Steps of Education training program includes six courses which cover all aspects of hydrodemolition, from streamlining work to cutting-edge techniques, allowing operators to increase jobsite efficiency and safety. Aquajet Systems specialists host the Academy program periodically throughout the year.

The training program incorporates individual courses offering more extensive training and adaptation to each customer's knowledge and experience:

Products: During the two-day course operators get to know their hydrodemolition machine from the inside out. The course is both practical and theoretical. The practical portion gives operators hands-on experience setting up and maneuvering the machine while the theoretical course includes a deep overview of the operations manual.

Hydrodemolition: The two-day course focuses on the concrete removal process. Operators will explore the robot's various programable settings and learn how to enhance precision and efficiency. This course also covers tips for increasing safety on the jobsite.

Streamlining Work: Aquajet instructors spend two days at one of the customer's jobsites to adapt their training to suit the contractor's specific line of work.

Safety and Technique: Often referred to as the most important part of the training program, this one-day course educates operators on the power and risks of the highly pressurized water used in hydrodemolition. It provides tips on how to best calculate pressure and flow and consider reaction force, as well as offers different techniques to get the job done in a safe and efficient way.

Service: Operators spend a full day learning how to maintain and adjust the robot's components to ensure equipment longevity.

Train the Trainer: This three-day course makes you a certified Aquajet instructor with the capability and knowledge to hold courses yourself. Requirements to take this course include being a distributor or customer of Aquajet, with at least one year of experience and obtain the required licenses.

Aquajet maintains small class sizes during each course, teaching approximately five students at a time to ensure a high level of individual attention and support. The course can also be adapted to specific operator skill levels and experience. For novice students, instructors will explain hydrodemolition basics before diving into the functionality of the Aqua Cutter robots. Skilled operators experience a more ambitious approach, which includes learning new techniques and specific settings that heighten efficiency.

For more information on the Aquajet Academy, or to register, contact Shawn Kirkpatrick at shawn@brokkinc.com.

CSDA HEADS BACK TO ASIA—JOINS OVER 100 DELEGATES IN TOKYO!

In May 2018, CSDA traveled to Japan for an industry event hosted by the International Association of Concrete Drillers and Sawers (IACDS).

The IACDS 2018 Annual Convention, held May 21-23 in Tokyo, provided a platform for industry representatives from all over the world to improve their knowledge of the international concrete cutting community through workshops, conference sessions, tours and networking events.

The aim of both IACDS and this event has long been to create an established forum for debate and the cultivation of ideas and opportunities.

The general assembly meeting was conducted by IACDS President Julie White. IACDS currently has 21 members including eight country associations from France, Germany, Japan, Spain, Sweden, Switzerland, United Kingdom and the United States.

The first day of the program included a tour and lecture at Dai-Ichi Cutter Kogyo. On the second day there were two conference sessions and an exhibit hall. Some of the topics discussed included case stories from Japan, monitoring health issues in the industry and recruiting millennials.

The 2018 IACDS Annual Convention also included several optional activities and social outings that allowed participants to see the many amazing sights of Tokyo, all while networking with their internationals peers.

The IACDS 2019 Convention will be held in April in Munich in conjunction with BAUMA.

For more information about the event, please visit www.iacds.org/convention.

CSDA BUILDS ON 6,000 GRADUATES – OPENS REGISTRATION FOR NEXT CLASSES

The Concrete Sawing & Drilling Association (CSDA) is pleased to announce a packed fall/winter 2018/19 training and certification schedule, with six hands-on courses planned at St. Petersburg College in beautiful Clearwater, Florida. Several additional training courses will be available in Las Vegas during World of Concrete (WOC) 2019.

CSDA has scheduled a series of hands-on comprehensive introductory classes geared toward anyone wishing to expand their

knowledge of cutting disciplines. They are followed by a series of advanced Operator Certification courses designed for experienced operators looking to gain proficiency in sawing and drilling techniques. Finally, WOC will provide a venue for additional training on concrete polishing, GPR and estimating.

As part of its Train More Save More program, the association offers large discounts to companies that send multiple operators to sawing and drilling courses. CSDA also has an online training website consisting of 27 courses available via www.csdatraining.com.

The association has hands-on, classroom and online courses for every discipline and skill level, allowing contractors to provide operators with superior training. To find registration details and other important information about classes, visit www.csda.org/training.

SIMPSON STRONG-TIE SUPPORTS GUATEMALA VOLCANO RELIEF EFFORTS

Simpson Strong-Tie donated $10,000 to the American Red Cross Disaster Relief Fund to assist relief efforts in Guatemala after the deadly Fuego volcano eruption on June 3.

The devastating effects of the eruption continue to be felt throughout Guatemala. At least 114 people are already known to have died because of the eruption, a number that is expected to grow. Hundreds more are still missing. Several thousand residents have been evacuated from the affected area.

The volcano has generated massive mud and pyroclastic flows, and heavy rains have worsened the impact by causing rivers to overflow. The Guatemala Red Cross is focusing its response operation on medical and health support, water, sanitation and hygiene, along with shelter, food and relief items. The donation to the Disaster Relief Fund is earmarked specifically for Guatemala.

"The strength and force of the volcanic eruption had an immediate and profound impact on hundreds of thousands of people in the affected area," said Simpson Strong-Tie CEO Karen Colonias. "It's our hope that they can get the help they need and on the road to recovery as soon as possible."

To make a contribution and aid in disaster recovery efforts through the American Red Cross, visit redcross.org or send a donation to your local Red Cross chapter.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your indusrty news to editor@icri.org. Content for the November/December 2018 issue is due by September 4, 2018, and content for the January/February 2019 issue is due by November 1, 2018.

ASSOCIATIONNEWS

ACI INCREASES INVESTMENT IN ACI FOUNDATION RESEARCH INITIATIVES

The American Concrete Institute announces that it has provided the ACI Foundation with an additional one-time contribution of $360,000. These funds will be used by the ACI Foundation in 2018 and beyond to fund much-needed research in collaboration with the work of ACI committees.

This one-time contribution follows ACI's commitment in 2017 to increase its annual funding to the ACI Foundation by providing $500,000 of annual mission funding and fully covering all operational expenses.

"This additional contribution from the American Concrete Institute will increase the ACI Foundation's capacity to fund much-needed research," stated Ron Burg, Executive Vice President, American Concrete Institute. "When coupled with funding from new and existing industry partners, the research projects to be funded are guaranteed to improve ACI's technical knowledge and make our world stronger and safer."

The ACI Foundation is a not-for-profit organization established by the American Concrete Institute to promote progress, innovation, and collaboration by supporting research and scholarships, while also serving as an independent resource to provide thought leadership and strategic direction for the concrete industry. Learn more at www.ACIFoundation.org.

ACI SELF-CONSOLIDATING CONCRETE TESTING TECHNICIAN CERTIFICATION NOW AVAILABLE

The American Concrete Institute announces the ACI Self-Consolidating Concrete Testing Technician certification program is now available.

This new program will certify individuals based on their technical knowledge and ability to correctly perform five ASTM test methods. These test methods were developed specifically for self-consolidating concrete and are used to measure its fresh properties, and include:

- ASTM C1610: Standard Test Method for Static Segregation of SCC Using Column Technique
- ASTM C1611: Standard Test Method for Slump Flow of SCC
- ASTM C 1621: Standard Test Method for Passing Ability of SCC by J-Ring
- ASTM C1712: Standard Test Method for Rapid Assessment of Static Segregation Resistance of SCC Using Penetration Test
- ASTM C175: Standard Test Method for Fabrication of a Test Specimen with SCC
- The certification consists of a written exam and a performance exam, and is valid for five years. The certification is offered through ACI's global network of more than 120 sponsoring groups in local concrete communities.

"As the interest and use of self-consolidating concrete increased, it became clear to the industry that standardized test methods were needed," said John Nehasil, Managing Director, Certification, American Concrete Institute. "ACI and ASTM committee members developed tests to measure and monitor the fresh or plastic characteristics of SCC. Near the end of the development stage, the industry recognized the need and importance of an ACI certification program to ensure these test methods were performed correctly," he continued. "If you work with and test self-consolidating concrete on a regular basis, then make sure you are certified to do the job right."

Self-consolidating concrete is regularly used for cast-in-place projects, specialized applications, and is the primary product used in the precast industry. It was first introduced in the early 1990s.

Learn more at www.whyACIcertification.org.

THE ACI CONCRETE CONVENTION AND EXPOSITION, LAS VEGAS, NV

The ACI Concrete Convention and Exposition attracts more than 2,000 engineers, architects, contractors, educators, manufacturers, and material representatives from around the world. Attendees will convene at the Rio All-Suites Hotel, Las Vegas, NV, USA, October 14-18, 2018, to collaborate on concrete codes, specifications, and practices. 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 ACI Convention is an opportunity to showcase the companies, projects, current events, and landmarks that inspired the convention theme of "Dream Big, Build Bigger." Convention highlights that attendees can look forward to include:

- International Lunch with special guest Rafael Barona Coghlan
- Student Pervious Concrete Cylinder Competition
- Young Professional Networking Event
- The Dennis Mertz Symposium on Design and Evaluation of Concrete Bridges
- Student Lunch with speaker Dr. Chip Espinoza
- Excellence in Concrete Construction Awards Gala
- Contractors' Day Lunch with speaker Paul Dudzinski, Mortenson-McCarthy Joint Venture
- An industry exhibition showcasing nearly 50 exhibitors

Throughout the convention, ACI will hold over 300 committee meetings, 40+ technical sessions, an industry trade exhibition, networking events, and more. Registration is open online through September 24, 2018 and discounted rates are offered until September 16, 2018. To learn more about the ACI Convention and to register, please visit www.aciconvention.org.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your association news to editor@icri.org. Content for the November/December 2018 issue is due by September 4, 2018, and content for the January/February 2019 issue is due by November 1, 2018.

PEOPLE ON THE MOVE

PROSOCO HIRES TWO REGIONAL SALES MANAGERS

PROSOCO customers in two different regions have new sales managers.

Parker Sloan, covering the Pacific Northwest, and Ken Rathbun, covering the Great Lakes-Chicago area, are the newest regional sales managers for the company.

Parker Sloan joins PROSOCO as a 10-year veteran in construction and building materials. He previously worked for Grace Construction products and GCP Applied Technologies.

Sloan will serve customers of all PROSOCO products in Utah, Idaho, Washington, Oregon, Alaska, British Columbia, Alberta and Manitoba. He succeeds Jake Boyer, who has recently been promoted to lead PROSOCO's cleaners and protective treatments group.

Ken Rathbun brings more than 11 years of experience in building materials to PROSOCO. Most recently, he worked in minerals technologies for Cetco Building Materials. He also worked at Hilti North America as a structural account manager.

Rathbun will serve customers of all PROSOCO products in Chicago, Wisconsin, Illinois, Minnesota and Michigan's western upper peninsula. He succeeds Nick Savage, who has recently been promoted to lead PROSOCO's concrete flooring group.

For information on PROSOCO visit prosoco.com.

TWO PROMOTED AS CHANEY ENTERPRISES IMPROVES SALES DEPARTMENT STRUCTURE TO MANAGE GROWTH

Chaney Enterprises, a ready-mix concrete, aggregates, custom blends, and related construction supplies provider, announced a new structure for the company's sales department alongside two internal promotions that will provide even better customer service and aligns with Chaney's continued, strategic growth.

Sal Bianco has been promoted to Northern/Eastern Shore Sales and Business Development Manager and Brandon Coombs has been promoted to Southern Sales and Business Development Manager. The promotions come with Chaney's restructured sales department, now divided into three teams. The Northern Team serves businesses north of U.S. Route 50 and Maryland's Eastern Shore, the Southern Team serves south of U.S. Route 50 and Virginia, and the D.C. Team serves Washington, D.C., inside of the Capital Beltway, and Prince George's County.

SAL BIANCO

BRANDON COOMBS

"Sal and Brandon bring years of industry experience and Chaney know-how to their new positions and will play an important role as we further streamline our sales structure to meet the needs of our customers," said Jan Holt, chief customer officer of Chaney Enterprises.

In their new roles, Bianco's and Coombs' primary responsibilities are to lead and mentor the sales teams, manage and grow accounts, identify new opportunities, cultivate sales, and streamline day-to-day processes.

Bianco, a resident of Catonsville, joined Chaney in 2011. Coombs has been with Chaney since 2003 and is a resident of Charlotte Hall. Both were previously sales and business development representatives.

For more information on Chaney Enterprises visit www.chaneyenterprises.com.

MIKE CALDARONE REJOINS CTLGROUP

MIKE CALDARONE

CTLGroup, an expert engineering and materials science firm headquartered in Skokie, Illinois, is pleased to announce Mike Caldarone has rejoined CTLGroup as a Principal Engineer in the Skokie office. Mr. Caldarone brings with him 35 years of experience in concrete materials engineering and will support the Materials and Consulting team efforts on the field and in the office.

Mr. Caldarone's responsibilities at CTLGroup include conducting engineering analyses and investigations to provide consultation, generating business to ensure group profitability, exploring and developing new markets, as well as aiding in the development of junior staff through mentoring and coaching.

As a previous employee of CTLGroup, Mr. Caldarone served as the Principal Engineer on many major projects such as the Hoover Dam Bypass Bridge in Nevada, the world's longest floating bridge (the SR 520 Bridge outside of Seattle, WA) the world's first Supertall building (the Burj Khalifa in Dubai, United Arab Emirates) and the Big Dig, located in Boston, MA.

For more information, please visit www.ctlgroup.com.

INTERESTED IN SEEING YOUR PEOPLE IN THIS COLUMN?

Email your People on the Move announcements to editor@icri.org. Content for the November/December 2018 issue is due by September 4, 2018 and content for the January/February 2019 issue is due by November 1, 2018.

TERRATHANE™

BLUE COLLAR GOLD STANDARD

TerraThane™ is the hardest working, highest quality **Geotechnical Polyurethane Foam (GPF)** in the world.

Lighter, more rugged and durable, less costly GPF for residential, commercial, infrastructure repair, and pipeline solutions.

Backed by NCFI's more than 50 years of industry-leading science and innovation, and legendary technical support.

BLUE COLLAR
GOLD STANDARD

Team TerraThane™

TerraThane.com

NCFI POLYURETHANES

CHAPTER MEETINGS & EVENTS

BALTIMORE-WASHINGTON
September 13, 2018
3rd QUARTER DINNER MEETING
Location: TBD

CAROLINAS
October 11 & 12, 2018
CHAPTER FALL CONFERENCE
Golf, Banquet, and Conference
Wilmington, NC

CHICAGO
July 20, 2018
CHAPTER SOCIAL OUTING
Chicago Dogs Baseball Game
Impact Field
Rosemont, IL

DELAWARE VALLEY
September 28, 2018
CHAPTER GOLF OUTING
Rock Manor Golf Club
Wilmington, DE
Philadelphia, PA

FLORIDA FIRST COAST
September 20, 2018
CHAPTER TECHNICAL MEETING
Topic: Construction Site Repair
Location: TBD

GEORGIA
August 23, 2018
CHAPTER LUNCHEON
Maggiano's Dunwoody
Dunwoody, GA

GREATER CINCINNATI
September 13, 2018
CHAPTER'S 20th ANNUAL GOLF CLASSIC
Mill Creek Course at Winton Woods
Cincinnati, OH

METRO NEW YORK
August 2018
CHAPTER ROOFTOP NETWORKING
Location: TBD
New York, NY

September 6, 2018
CHAPTER BREAKFAST PRESENTATION
Topic: Ethics
Club 101 Manhattan
New York, NY

September 20, 2018
CHAPTER GOLF EVENT
Cedar Hill Golf and Country Club
Livingston, NJ

MID-SOUTH
July 18, 2018
CHAPTER SUMMER MEETING
ICRI and ACI 562
DoubleTree Hotel
Memphis, TN

MINNESOTA
July 24, 2018
CHAPTER GOLF TOURNAMENT
Edinburgh USA
Brooklyn Park, MN

NEW ENGLAND
September 11, 2018
CHAPTER ROUNDTABLE DISCUSSION
Stockyard Restaurant
Brighton, MA

NORTHERN CALIFORNIA
September 28, 2018
CHAPTER ONE-DAY SYMPOSIUM
Repairs after Earthquakes and Fires
California Cement Masons
Pleasanton, CA

ROCKY MOUNTAIN
August 13, 2018
CHAPTER GOLF TOURNAMENT
Hiwan Golf Club
Evergreen, CO

September 27, 2018
CHAPTER SPORTING CLAYS
Kiowa Creek Sporting Club
Arapahoe County, CO

SOUTH CENTRAL TEXAS
September 20, 2018
CHAPTER MEMBERSHIP LUNCHEON
NXNW Restaurant & Brewery
Austin, TX

VIRGINIA
September 20, 2018
CHAPTER FALL SYMPOSIUM
Topic: ACI 562 Repair Code
Colonial Heritage Golf Club
Williamsburg, VA

INTERNATIONAL CONCRETE REPAIR INSTITUTE

WOMEN in ICRI

ICRI announces the formation of a dynamic forum for its female constituents and members to:

- network;
- advance knowledge;
- address barriers that may be controversial regarding growth and participation in policy making and industrial leadership; and most important,
- recognize the challenges and successes of women who share a place within the concrete repair industry.

"We empower one another by supporting and helping one another."

If you are interested in the development and participation in this group, contact:
Katherine Blatz, Katherine.blatz@basf.com | Monica Rourke, Mrourke@mapei.com
Gigi Jaber-Sutton, gigij@icri.org

2017 ICRI Chapter Awards

BY DALE REGNIER

The ICRI Chapter Awards Program gives recognition to our chapters that, through their operations, programs and activities, display a dedication to excellence and a commitment to success. The program is designed specifically to help each and every chapter, no matter the size, create their own unique roadmap to success. By reviewing chapter activities and assessing chapter operations, each chapter can determine areas where they excel and where they might need to focus a bit more attention. These awards are for activities during the 2017 calendar year, 25 chapters took the time to evaluate their efforts and strengthen their missions.

There are three possible awards. Chapters achieving 76 to 100 points are considered Excellent. Chapters garnering more than 100 points are deemed Outstanding. And, the one chapter to achieve the highest number of points is named Chapter of the Year. As a bonus, the ICRI Chapters Committee has added an award for "Most Improved," for the chapter that submits an awards application for a second year in a row and shows the greatest percentage of improvement.

The awards were presented at the 2018 Spring Convention in San Francisco, California. ICRI is pleased and proud to share these winners with all of ICRI. After all, chapters are the lifeblood of this organization.

Excellent Chapter Awards

New England
Term President: Todd Neal
Submitted by: Catherine Maloney

Northern California
Term President: Cruz Carlos
Submitted by: Rob Kirschbaum

Awards for Outstanding Achievement

Baltimore-Washington
Term President: Shannon Bentz
Submitted by: Shannon Bentz

British Columbia
Term President: Meghdad Hoseni
Submitted by: Dave Bishop

Carolinas
Term President: Hayes Thompson
Submitted by: Robert McDowell and Hayes Thompson

Chicago
Term President: Christopher Kottra
Submitted by: Christopher Kottra and Sean Meracle

Connecticut
Term President: Larry Keenan
Submitted by: Tammy Gaherty

Delaware Valley
Term President: Pat Gallagher
Submitted by: Pat Gallagher

Florida First Coast
Term President: Jason Bousquet
Submitted by: David Poulter

Florida West Coast
Term President: Timothy Price
Submitted by: Timothy Price and Joe Trocano

Georgia
Term President: Josh Lloyd
Submitted by: Evan Moore

Gulf South
Term President: Steve LeMay
Submitted by: Steve LeMay and Danny Horn

Chapter representatives from around the country proudly display their chapter patches

Chapter of the Year went to the Great Plains Chapter! They are represented here (left to right) by ICRI National President Ralph Jones, Great Plains Chapter President and ICRI Board Member Jon Connealy, and future ICRI leader Matthew Carter

Indiana
Term President: Ryan Hill
Submitted by: Dan Calabrese and Ryan McCreery

Metro New York
Term President: Stephen Franks
Submitted by: Alyssa Somohano

Michigan
Term President: Andrew Lobbestael
Submitted by: Douglas Barron, John Kosnak, and Andrew Lobbestael

Minnesota
Term President: Andy LeBarron
Submitted by: Andy LeBarron, Kim Deibel, and Rick Elsner

North Texas
Term President: Julie Bolding, P.E.
Submitted by: Mark LeMay and Pete Haveron

Northern Ohio
Term President: Thomas Lavelle
Submitted by: Thomas Lavelle

Pittsburgh
Term President: Bob Mason
Submitted by: Mike Wuerthele

Quebec Province
Term President: Jacques Bertrand
Submitted by: Eric Bellerose, Jacques Bertrand, Baltazar Basabe, Roxanne Ouellet and Jean-Francois Rondeau

Rocky Mountain
Term President: Kim West
Submitted by: Kim West

Southeast Florida
Term President: Evan Swaysland
Submitted by: Evan Swaysland

Toronto
Term President: Stephen Franks
Submitted by: David Huggins

Virginia
Term President: Jon A. Hunger
Submitted by: Jon A. Hunger

Most Improved Chapter

Gulf South

Chapter of the Year

Great Plains
Term President: Curtis Barkley
Submitted by: Curtis Barkley and Jon Connealy

CHAPTER NEWS

PITTSBURGH HOSTS GOLF EVENT

The Pittsburgh Chapter recently held its 19th annual golf outing, with proceeds benefiting the Chapter scholarship fund. Another great day was had by all. A special bonus to this year's golf included a hole-in-one on the sixth hole by John Romah. Special thanks to Golf Outing Chairman Mike Wuerthele for his continued hard work and passion for this outing. The Chapter would also like to give a big thanks to the sponsors and golfers who make this event a success every year. We couldn't do it without you!

Pittsburgh Chapter golfers gather for instructions and rules before they take off for the fairways at Cranberry Highlands

2018/2019 CHAPTER NEWS DEADLINES

SEPTEMBER/OCTOBER 2018
July 10, 2018

NOVEMBER/DECEMBER 2018
September 10, 2018

JANUARY/FEBRUARY 2019
November 10, 2018

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

For the latest ICRI Chapter information visit www.icri.org

METRO NEW YORK HOSTS JOINT BUILDING ENVELOPE SEMINAR

On April 27, 2018, more than 115 guests attended Metro New York's third annual all-day seminar, hosted in conjunction with RCI New York. This year, the chapter hosted a seminar covering various topics in the building envelope. Matt Normendeau of Simpson Gumpertz & Heger opened up the event with his presentation on Plaza Deck Waterproofing. Joe Hoekzema spoke about blue roofs, followed by a flood proofing presentation given by Kenrick Hartman and Doug Stieve of Wiss, Janney, Elstner Assoc. Tim Lynch of the New York Department of Buildings spoke next and was followed by Lurita McIntosh Blank's presentation on railings. Peter Brooks of IR Analyzers finished off the event with a talk on integrity testing. At the end of the day, guests enjoyed a networking cocktail hour.

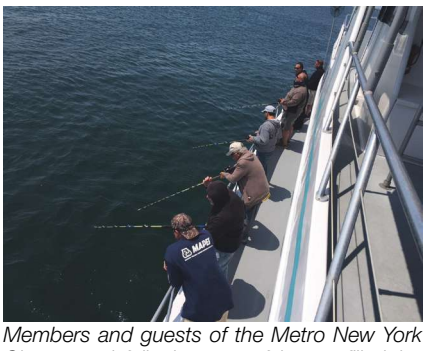
The board members of Metro New York gathered for a photo with guest speaker Joe Hoekzema

The space at Club 101 in Manhattan is the perfect place to host the Metro New York Chapter events

METRO NEW YORK HOSTS ANNUAL FISHING TRIP

On June 7, guests boarded Captain Jim III in Freeport, NY, for the Metro New York chapter's fifth annual fishing trip. Breakfast and lunch were served, and prizes were awarded for biggest fish and 50/50. A great time was had by all, making this event a big success for the chapter for the fifth year in a row!

The team from Captain Jim III was helpful when it came to baiting the hooks



Members and guests of the Metro New York Chapter took full advantage of the sun-filled day and of their time on a beautiful set out to sea

SOUTHERN CALIFORNIA LUNCH SEMINAR

The ICRI Southern California Chapter hosted a Technical Lunch Seminar on May 7, 2018. This particular seminar coincided with National Safety Week and the presentation was on New Silica Regulations and the impact on the concrete repair industry in Southern California. The featured speaker was Dan Juliano from Bosch Tools. The seminar also featured tabletop displays from Bosch, Hilti and Aramsco for the attendees to peruse.

CAROLINAS HOSTS MEGA DEMO

On May 17-18, the Carolinas Chapter of ICRI hosted their 2018 Spring Conference and Mega Demo in Raleigh, NC. This event occurs once every three to four years and has traditionally been one of the chapter's most popular and well-attended events. The two-day meeting started with technical sessions on Thursday morning at the headquarters hotel on topics ranging from stadium waterproofing to single process repairs with fiber reinforced cementitious matrix. On Thursday afternoon, the conference moved to the Constructed Facilities Laboratory on the campus of NC State University for hands-on demonstrations of non-destructive imaging techniques and testing of a fiber reinforced cementitious matrix beam. Professional Engineer and NC State lecturer Ben Smith wrapped up the day with a comprehensive tour of the university's lab facility.

The Mega Demo portion of the meeting took place all day Friday at "The Barn" at the NC State Beef Educational Unit. It's a unique venue with a covered, open area for demonstrations and bleacher style seating for attendees. From 8:30 am until 4:00 pm, attendees were treated to 13 demonstrations of a wide range of products and techniques. The Mega Demo format allows participants to get up close and personal with materials, equipment and products and volunteers are invited to come to the demonstration area to try some things for themselves. Moderated by Carolinas Chapter board member and Terracon Senior VP Bill Brickey, demonstrations were conducted by BASF, Keim Coatings, Vector Corrosion Technologies, SpecChem, Structural Group, RPM Belgium Vandes, Neogard, Milliken Infrastructure Solutions, Prosoco, Sika, Simpson Strong Tie, Husqvarna and CTP Construction Tie Products. Over 90 concrete professionals attended over both days of the event.

The Carolinas Chapter recognizes Guaranteed Supply, Terracon and High Rock Waterproofing for their sponsorship and contributions which helped make the Mega Demo a successful event. The Carolinas Chapter's Fall Conference, Awards Banquet and Golf Tournament are scheduled for October 11 and 12 in Wilmington, NC.

The Chapter hosted their Mega Demo at "The Barn" at the North Carolina State University's State Beef Educational Unit

The demonstrations included a variety of products and materials

This event once again brought in a big crowd

Many ICRI member companies were invited to present their products to the group

BALTIMORE-WASHINGTON HOSTS AUTOBAHN SOCIAL EVENT

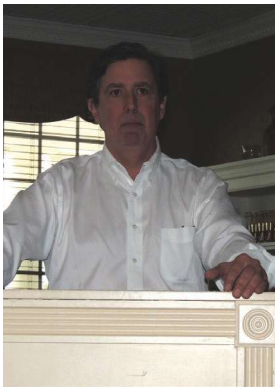
On April 19, 2018, the ICRI Baltimore-Washington Chapter held a social event at the Autobahn Speedway in Jessup, Maryland. The chapter was able to fully sponsor this event and those who attended enjoyed some heart-pounding racing at speeds of up to 50 MPH! Our group of nine faced off for three races and battled through the twists and turns on both tracks to determine who among us was the fastest. Even though the track operator had control of our carts at all times and could adjust our speed as he saw fit, Eduardo Acero was crowned as the champion after finishing in first place two out of three races. In all, our group enjoyed some competitive fun against fellow chapter members and we look forward to hosting similar events in the future, hoping to increase attendance for these social outings.

A select few members from the Baltimore-Washington Chapter were able to experience the Autobahn Speedway up close and personal

A competitive spirit and the thrill of the track infused the event

VIRGINIA HOSTS SUCCESSFUL SPRING SYMPOSIUM

Colonial Heritage Club in Williamsburg, VA, was the venue for the ICRI Virginia Spring Symposium and golf tournament on May 18, 2018. The Symposium theme was Repair, Restoration and Sustainability of Airports and featured presentations on runway and pavement maintenance, repair of parking facilities and an introduction to low-density cellular concrete. Symposium attendees wrapped up their day with a round of golf on the championship course on site at Colonial Heritage. The Virginia Chapter will host their Fall Symposium back at Colonial Heritage on September 20, where the topic will be ACI 562 Concrete Repairs.



Ed Brennan from US Concrete Products presented on the Repair & Protection Systems for Airport Structures, Facilities and Runways

Kevin Goudarzi joined the group from KGS Construction to give his presentation on the Seismic Retrofitting of a 28 story hotel

Giving his presentation on Low-Density Cellular Concrete and its Applications in Runway Maintenance is presenter Nico Sutmoller with Aerix Industries

ICRI has 39 chapters, including 2 student chapters, in metropolitan areas around the world. Chapters hold technical presentations, educational meetings, symposiums, and local conventions on repair-related topics.

Chapters also provide an outstanding opportunity to meet and build relationships with repair specialists in your area. In addition to the technical meetings, chapters also host golf outings, social evenings, dinner cruises, and other networking events.

CHAPTER NEWS

CHAPTERS COMMITTEE CHAIR'S LETTER

MICHELLE NOBEL
Chapters Chair

Summer is definitely here in Florida, we've even had our first subtropical storm of the 2018 Atlantic Hurricane Season! Alberto came six days before the official start of the hurricane season, which starts June 1. I wasn't even familiar with what a subtropical storm was—I've always heard tropical depression, tropical storm, hurricane, bigger hurricane, even bigger hurricane and biggest hurricane ever!! The trials and tribulations of living in Florida! Well, apparently there is a difference between a tropical storm and subtropical storm. It's more of a meteorological term, but it has to do with the upper winds of the storm and it's typically outside the normal hurricane season that runs from June 1 to November 30 every year. After losing power for a week with Irma, I'm really nervous about going into the hurricane season this year—understandably so. Although most of us in Florida—like me—are pretty prepared.

Speaking of being prepared for special events, this is a great time to take a look at your chapter events and see what programs you can schedule for the summer months for your members. Summertime can prove to be challenging in getting members to attend. Fun events, like a baseball game, a meeting at a brewery or a whiskey tasting and cigar social bring members together for a good time in a relaxed and different atmosphere. The Florida West Coast Chapter thought outside the box this year to bring some new and exciting events for their members, and it paid off with successful and well attended meetings.

I'm pleased to announce the addition of two new chapters—the Central Ohio Chapter and the Mid-South Chapter. Congratulations to all the officers and members who came together to make these chapters possible. Hopefully, coming soon: Panama City, Mexico and Saudi Arabia. ICRI is reaching out globally to have chapters around the world, which will make ICRI truly international and a household name. Remember when you're traveling to reach out to the local chapter to see if they're having an event while you're in town. It's always great to see how other chapters run their meetings. It's like global networking, which takes networking to a whole new level!

The next ICRI Chapter Roundtable will be in Philadelphia, September 17-18. The Philadelphia, Baltimore-Washington, Delaware Valley, Metro New York, Connecticut, Pittsburgh, New England, Quebec and Toronto chapters will all be invited to attend. Make sure you send two delegates to the roundtable events in your area so your chapter can benefit from these meetings. Some of the best ideas come out of the roundtable meetings, and I can promise you that you won't regret going to one!

The Fall Convention will be in Omaha, Nebraska, November 7-9. The theme of the convention is Resiliency, Above and Beyond Concrete Repair. The events and all the convention details will be coming out soon, so stay tuned! ***All*** chapters should send a delegate to the convention. This is an opportunity for newer members or even members that haven't been to a convention for a few years to take advantage of this program. To find out more information on being a delegate, please talk to your current chapter president or go to the icri.org website.

The next Concrete Slab Moisture Testing classes will be held in Baltimore, MD, September 19-20. If you're looking to become a qualified concrete surface repair technician, now's your chance. The Concrete Surface Repair Technician (CSRT) Certification Program, the Certified Concrete Slab Moisture Testing Technician (CCSMTT) Certification Program and ACI 562-16 Repair Code and Guide Training are training programs offered by ICRI. To find out more information on these programs please visit icri.org and go to the Education tab at the top of the page or contact the ICRI Office at (651) 366-6095.

I hope everyone is safe, stays cool and enjoys the summer with their families and friends. Before you know it it'll be fall, and I'll be seeing you in Philly for the next ICRI Chapter Roundtable!

Sincerely,
Michelle Nobel
2018 Chapters Committee Chair

For the latest ICRI Chapter information visit www.icri.org

In Need of Repair

ICRI Fills the Need for Training in the Concrete Repair Industry

The single largest opportunity for people entering the construction trade is in concrete repair, rehabilitation, and restoration.

More concrete is used than all other construction materials combined—12 billion tons placed annually. It is the second most common man-made material in the world, second only to potable water. However, the volume of *existing* concrete is at least 30 times the volume of new concrete—at least 360 billion tons of existing concrete worldwide.

Despite its durability, concrete structures require maintenance and repair.

The ASCE Report Card estimates $4.6 trillion needs to be spent over the next 10 years to return our infrastructure to a "C" rating—$14,241 per American citizen.

Concrete repairs are not performing satisfactorily.

The US Corps of Engineers Study REMR CS2 states, "A little more than 50% of the repairs performed on Corps structures are performing satisfactorily, which is an unacceptable rate. Failures are attributable to design or evaluation errors, material performance, and installation or construction errors. The Corps' experience is not unusual."

The Corps' findings were confirmed by CONREPNET—an examination of 215 case histories where about 50% of repairs were deemed successful. Of those repairs it was found that 20% deteriorated within 5 years, 70% within 10 years, and 90% deteriorated in 25 years.

We NEED trained concrete repair professionals.

An informal poll conducted at the 2017 International Concrete Repair Institute Fall Convention reported over 95% of contractor members polled indicated a need for new workers to go immediately to work in the concrete repair and restoration field.

Due to the number of concrete structures that are in need of repair, restoration, and maintenance—*and* the lack of satisfactory performance of repairs previously performed—the need for field workers who are trained in concrete repair methods and standards has never been greater.

Educational content exists.

ICRI had its origins at a World of Concrete seminar in February 1988, during which attendees voiced their frustration about the lack of standards and guidelines for concrete repair. They also expressed their concern over the proliferation of unqualified contractors entering the industry. These contractors were not properly trained in concrete repair and were underbidding without proper knowledge of surface preparation, equipment, materials, techniques, etc.

Since then, ICRI has created and updated technical guidelines, publications, and certification programs to educate concrete repair professionals on all aspects of concrete repair.

INTERNATIONAL CONCRETE REPAIR INSTITUTE

NEW PRODUCTS

WAGNER METERS' SMART LOGGER™ IS YOUR UNBLINKING EYE FOR JOB SITE AMBIENT CONDITIONS — EVEN WHEN YOU ARE AWAY

Wagner Meters announces a new monitoring device that tracks and documents ambient temperature and relative humidity conditions discretely and constantly, even when you are away from the job site.

Called the Smart Logger™, the monitor is a temperature and relative humidity data logger utilizing the latest Bluetooth® 4.0 technology.

The 2-inch square monitoring device sends data to the Smart Logger™ app that Wagner Meters offers for free for both Apple and Android smart devices. The app connects the Smart Logger™ device through a Bluetooth® 4.0 connection. This enables you to transmit and record ambient relative humidity and temperature data, and send the data reports via email, directly from the job site.

Simple and Discrete Operation

Simply install the monitoring device on a wall or other out-of-the-way location at your project site, then set the desired parameters on the free Smart Logger™ app. Now you can collect and store up to 12,000 readings of ambient temperature and relative humidity conditions over a time period of up to 300 days, depending on frequency of readings and strength of transmission sensor. When you return to the job site one or more days later, use the app for fast, convenient data collection via Bluetooth®. After downloading the data to your mobile device, you can quickly send a report to the general contractor (GC) or your client.

The Smart Logger™ monitoring device is small, lightweight, easily mountable, and highly accurate. In addition to storing temperature and relative humidity data, the Smart Logger™ can also be utilized during the wood flooring acclimation process and the storage of wood flooring. In some cases, you may choose to leave the device behind after the job is completed to record ambient conditions in the event of a flooring issue in the future.

Consistent documented readings of ambient conditions provided by the Smart Logger™ will tell an installer if the job site conditions have met ASTM F2170 parameters and are appropriate for the wood flooring installation. The installer will also have time-stamped documentation that will show if job site conditions have deviated from serviceable at any time during the monitoring process. Using the app, ambient condition reports can be emailed to customers or other stakeholders with a few simple keystrokes.

Anyone using a smart device with Bluetooth® 4.0 or above can download and install the Smart Logger™ app for free from the Apple App Store or Google Play.

The Smart Logger™ device itself can be purchased online at www.wagnermeters.com/smartlogger in single packs, 5 packs, and 20 packs.

LED JOBSITE ACHIEVES ONE HUNDRED MILLION KWH SAVED MILESTONE

Product savings equates to removing 16,000 cars from the road for one year

Lind Equipment—leaders in portable LED lighting for construction companies—has announced that the award-winning LED Jobsite solution has reached a significant milestone that benefits users and the community at large.

Having tracked in real time the energy savings of their clients' construction projects, Lind Equipment's state-of-the-art LED Jobsite lighting solutions have reached one hundred million kWh of energy savings. This is the equivalent to removing 16,000 cars from the road for one year, or powering 11,000 homes on an annual basis.

The milestone was reached in a little over two years, with the savings growing exponentially as adoption rates increase. If you monetize the savings using an average of 10 cents/kWh (national average), it adds up to $10M of savings.

It's important today, for construction companies to pay attention to their jobsite carbon footprints. After decades of wasteful practices that are destructive to the environment, using LED Jobsite lights is a proactive step toward reducing the carbon footprint of construction sites.

Most consumers are familiar with the benefits of LED lighting; it has a lower total cost of ownership, is more energy efficient, has a longer life and is safer for the environment than traditional bulb-based lights. However, he noted that it is often overlooked and underestimated just how concentrated those savings are on a construction site—where temporary lighting is typically run 24 hours a day over many months, or years at a time. Lind Equipment's LED Jobsite lights not only save money and provide great benefit to the environment, but they are easy to install.

The energy savings that result when switching from bulb-based lighting to LED lighting can potentially add up to hundreds of thousands of dollars in savings. Not only is energy consumption reduced by 80 percent, but less LED lights will be needed to light up the same area.

LED Jobsite lights available on the market today can replace the need for stringlights in almost all areas. With just one 360-degree LED area light, contractors can replace up to 250 feet worth of stringlights, reducing installation points by 95 percent. LED Jobsite lights have easy daisy-chaining capabilities with a predetermined length of cable on each side that matches the recommended spacing between a variety of lights. This saves on the labor and materials required for installation.

Current statistics show that only about 20 percent of lighting can be recovered for use on another job. In contrast, LED Jobsite lighting allows temporary lighting to be considered assets and reused from project to project. In addition, with no bulbs to replace, quicker installation/uninstallation time and fewer electrical circuits required, even without considering the energy costs, adopting LED on a jobsite will provide a return on investment based on labor savings alone. The labor at all stages—installation, maintenance and at takedown—is dramatically reduced. With the benefit of reusing the lights on additional jobs, the cost-benefit considerations weigh heavily in favor of LED.

The necessity of making the change to LED has become more apparent. Now is the time to realize energy savings at your jobsites. Place yourself at a competitive advantage and make your jobsites known for their efficiencies in energy and labor savings. Contact us today at www.ledjobsite.com for information on how to take the next step.

MARYLAND STATE HIGHWAY ADMINISTRATION APPROVES KEYSTONE® KEYSYSTEM™ II RETAINING WALL SYSTEM

The Maryland State Highway Administration (MSHA) recently issued approval of the Keystone® KeySystem™ II retaining wall system, using Keystone Compac® II or III and TenCate Miragrid® reinforcement for use on state highway projects for walls up to 50 feet high.

KeySystem™ II is designed to the highest standards and unique requirements of the transportation sector. The system consists of Keystone Compac® II or III units and TenCate Miragrid® geogrids by TenCate Geosynthetics. As the leading commercial retaining wall product on the market, Keystone Compac® features an open core design and the pin connection system. The Keystone Compac® is lighter weight than other structural blocks and has a shortened tail design that makes it easier to handle. KeySystem™ II is approved for use by 27 state highway administrations.

For more information on KeySystem™ II and other Keystone® structural products, visit the PRODUCTS tab and/or the RESOURCES tab at www.keystonewalls.com, or call (952) 897-1040. Structural applications supported by Keystone® products include government, commercial, industrial, recreational, public works, and residential projects.

VEXCON ANNOUNCES NEW FAST-DRYING PENETRATING WATER REPELLENT SEALER

CERTI-VEX PENSEAL 244 FD is a high performance, breathable fast-drying clear silane water repellent penetrating sealer. The product is ideal for cool weather applications and where dry time is critical for fast return to service.

Certi-Vex Penseal 244 FD stops the intrusion of water, salts, deicer chemicals, and acids, which often result in efflorescence, mildew growth, corrosion, scaling, spalling, surface erosion, and other costly damage to hard surfaces.

Treatment of reinforced concrete reduces surface erosion and corrosion of rebar caused by attack of water and water borne salts and alkalis.

Benefits

- Fast drying—quick return to service
- Ideal for cool weather applications
- Extends the life of concrete and masonry
- Long-term protection against salt corrosion, mildew, water, wind driven rain, airborne contaminants, surface spalling and other extreme weather conditions

To learn more about Vexcon and our products visit vexcon.com.

VEXCON CHEMICALS ANNOUNCES NEW HIGH PERFORMANCE COATINGS

Vexcon Chemicals, an industry leader providing innovative product solutions through the development of advanced chemical technologies designed to meet today's construction demands, is pleased to announce Vexcon's ProCoat brand of epoxy and urethane durable coatings for concrete.

ProCoat are high moisture tolerant 100% solids epoxy coatings designed to protect and seal a variety of concrete surfaces. This high build system effectively prevents moisture related issues such as bubbling and peeling. When used with our exclusive primer, the product can be applied to fresh concrete.

Vexcon offers standard and customized systems utilizing the latest in polymer technology to meet the performance demands of today's building owners. ProCoat are high build seamless floors that can be used with decorative quartz and vinyl chip systems to create a variety of textures and aesthetics. ProCoat products are ideal flooring systems for demanding industrial, institutional and commercial environments.

Benefits

- Superior durability
- Eliminates the need and costs to mitigate moisture
- Chemical & abrasion resistance
- Quick drying
- Excellent adhesion
- UV resistant
- Moisture tolerant

To learn more about Vexcon and our products visit vexcon.com.

VEXCON ANNOUNCES NEW PENETRATING WATER REPELLENT SEAL & CURE

STARSEAL GUARD DC is a water based innovative one-step product that combines the benefits of a penetrating water repellent sealer and a dissipating white curing compound for fresh concrete into one product.

The product, which meets ASTM C-309 curing requirements and the Chloride Ion Penetration requirements of NCHRP 244, forms a temporary film

that restricts moisture loss allowing concrete to reach maximum strength and durability. When the curing compound wears off, the concrete remains protected from the harmful affects of freeze thaw cycles, salts and deicer chemicals that can result in costly damage to concrete.

This innovative one-step product eliminates the costly removal of curing compounds and time consuming water curing of fresh concrete when a protective penetrating water repellent sealer is desired. Once applied, the surface is properly cured and water repellent in one application and puts concrete into service weeks sooner.

Benefits

- Complete projects faster
- Seal & protect against damage from salt and moisture
- Produce stronger, more durable and longer lasting concrete
- Cures fresh concrete
- Meets industry standards
- Cost effective

To learn more about Vexcon and our products visit vexcon.com.

SIMPSON STRONG-TIE MPBZ MOMENT POST BASE IS FIRST PRODUCT CODE LISTED FOR MOMENT RESISTANCE

The innovative MPBZ moment post base by Simpson Strong-Tie, the industry leader in engineered structural connectors, fasteners, anchors and building solutions, is the first product in the industry to receive an ICC-ES code listing for moment resistance.

The MPBZ, which is the first off-the-shelf product to provide moment resistance for wood columns or posts, is now code listed under ICC-ES ESR-3050 for its 4x4 and 6x6 sizes. The MPB44Z and MPB66Z are also code listed for uplift, download and lateral resistance.

The patent-pending MPBZ is ideal for freestanding outdoor structures, such as pergolas, patios, carports and decks. It features an innovative, overlapping sleeve design, which completely encapsulates the post, keeping it from rotating around its base when lateral loads are applied at the top of the post. Built-in standoff tabs provide the required 1" standoff to protect against post rot while eliminating multiple parts and assembly. In addition, the MPBZ has a ZMAX® finish to provide corrosion resistance in many environments.

The MPBZ's ability to withstand lateral loads greatly reduces or eliminates the need for additional bracing. The post base is engineered and tested to save engineers, architects and contractors the time and expense involved in designing, calculating and ordering custom-fabricated parts. In addition to the 4x4 and 6x6 sizes, the MPBZ is also available for 8x8 posts.

For more information, visit strongtie.com/mpbz.

PROCEQ LAUNCHES ULTRA WIDEBAND GPR (GROUND PENETRATING RADAR) IN USA

Proceq is proud to announce the launch of the GPR Live in all USA markets. The instrument was designed and is manufactured in Switzerland by Proceq AG, world renowned for innovative testing solutions since 1954.

Proceq USA Sales and Marketing Manager Paul Siwek said: "We are very pleased that with the recent FCC sanctions we can now offer this instrument to our customers in the USA. Our clients will find the new Proceq GPR Live, featuring its advanced design and capabilities, to be an ideal tool for the majority of GPR inspection of reinforced concrete structures."

The Ultra Wideband GPR Live is the most cutting-edge Ground Penetrating Radar available today.

Proceq's GPR Live utilizes steeped-frequency continuous-wave (SFCW) technology, never before used in structural GPR applications, to allow clearer and faster concrete inspection. SFCW benefits include:

- Frequency range: 0.9 to 3.5 GHz for structural concrete applications, eliminating the need to switch antennas for clear images of both shallow and deep areas
- Maximum peak power: 10 dB
- Maximum depth range: 28 inches (70 cm)
- Built-in live-wire detection feature
- Clear images of both shallow and deep areas
- Multiple measurement modes

Wireless Connectivity and Data Processing

The GPR Live further improves the data collection process by wirelessly connecting to any iPad running iOS 9.0 or greater through the free Proceq GPR Live app. By connecting to a wireless device, results can be immediately viewed on a high-resolution touchscreen of up to 12.9 inches (iPad Pro), the largest GPR display in the industry. Through the app you can collect, analyze, and share data instantly, drastically reducing the total job time.

The Proceq GPR Live is incredibly user friendly. The portable scan car is tough, yet lightweight and portable. It is flight-safe and operates on 8 AA batteries (alkaline or rechargeable). The wirelessly connected app has a user-friendly interface that makes creating notes and logging measurements, time, and location simpler than ever before. All information is automatically synchronized with your cloud account, allowing users to share data anytime, anywhere. The efficient design also includes accessories for accessing hard to reach areas. The GPR Live is easy for one person to operate, and will minimize both time and labor costs.

Proceq GPR Live Wide Range of Applications

- Structural integrity assessment
- As-built verification of new construction
- Investigation of concrete and masonry structures
- Hit prevention for drilling, coring, sawing
- Detection of rebar, voids, ducts, back walls, and live wires
- Assessment of asphalt and concrete layer thickness (slabs, roads, pavement)

The GPR Live is available for purchase or as a rental product, suiting a variety of customer needs. With our Pro model rental plan, renters can experience full functionality at an unbeatable price, often paying as little as $210 a month.

For additional information about Proceq and its products, visit www.proceq.com

BOSCH BLAZE™ OUTDOOR GLM400C CONNECTED LASER MEASURE WITH VIEWFINDER AND BOSCH BLAZE™ OUTDOOR GLM400CL CONNECTED LASER MEASURE WITH CAMERA DELIVER RELIABLE DISTANCE MEASURING IN BRIGHT LIGHT

Laser measures provide accurate measurement in virtually any light condition

Using a standard laser measure outside is often a hit-or-miss affair, dependent upon cloud cover, trees and a building roof or overhang that may block the sun. All of these random elements are now history thanks to the advanced technology and versatility of the Bosch BLAZE™ Outdoor GLM400C Connected Laser Measure with Viewfinder and the Bosch BLAZE™ Outdoor GLM400CL Connected Laser Measure with Camera.

Both outdoor laser measures rely on a 5.0-megapixel, 8X zoom camera with scratch-proof screen to find the laser target at up to 400 ft. in bright conditions, expansive indoor space or against busy backdrops. The easy-to-read color display illuminates large numbers and provides clear resolution in dark areas. The BLAZE GLM400CL version can take photos and comes with memory for 50 measurements and storage for up to 200 images, in addition to a lithium-ion battery.

Default real-time measurement provides immediate, accurate measuring that automatically adjusts as the user moves closer or farther from the target. Measurement accuracy is +/- 1/16 in. Each device is sized to fit into any pocket for easy access. A digital bubble level provides a visual reference when measuring horizontal distances.

Measurement documentation can be transferred quickly to a smartphone or tablet relying on Bluetooth® connectivity in conjunction with Bosch's MeasureOn app. Note: Photo files are too large to transfer via Bluetooth®, but can be transmitted using supplied USB cable. Easily organize, document and transfer measurements using the free Bosch MeasureOn app. The free-to-download app provides an intuitive and clear digital project overview, including floor plans, measurements and notes.

"Not every laser measuring job is indoors under controlled light conditions," said Brandon Eble, product manager, measuring tools, Bosch Power Tools. "A high percentage of jobs will require some outdoor measuring. Typical jobs are in direct sunlight for about 75 percent of the project due to light coming through incomplete walls without drywall or another covering. This drove us to develop the Bosch BLAZE Outdoor GLM400C and GLM400CL laser measures. Our goal was to provide a tool that could be used for a full job, no matter the lighting conditions or distance required."

The BLAZE Outdoor GLM400C and BLAZE Outdoor GLM400CL laser measures provide default real-time measuring, as well as length, area, volume and indirect measuring functions that are easy to employ using a display guide that walks the user through each measurement process. A built-in inclinometer determines the angle of pitch (tilt angle 360°), maximum/minimum stake out lengths and double indirect measurements. It also confirms when the tool is level.

The Bosch BLAZE Outdoor GLM400C with Viewfinder is powered by three AA batteries and includes a hand strap and pouch. The Bosch BLAZE Outdoor GLM400CL with Camera includes an integrated, rechargeable 3.1 Ah ithium-ion battery that delivers enough runtime for all-day jobs, along with a micro USB cable, a battery charger, hand strap and pouch.

To learn more visit www.bethepro.com.

INTERESTED IN SEEING YOUR NEW PRODUCTS IN THIS COLUMN?

Email your new product information to editor@icri.org. Content for the November/December 2018 issue is due by September 4, 2018 and content for the January/February 2019 issue is due by November 1, 2018.

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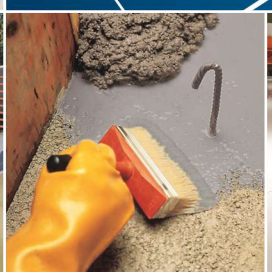
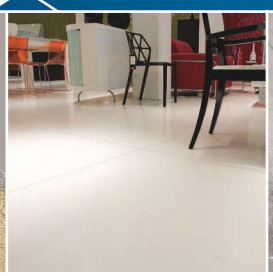
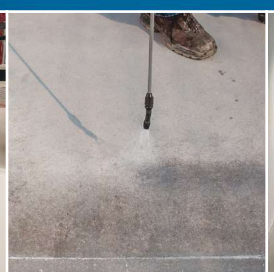

MAPEI offers a full spectrum of products for concrete restoration, waterproofing and structural strengthening. Globally, MAPEI's system solutions have been utilized for bridges, highways, parking garages, stadiums, building and other structures.

Visit www.mapei.com for details on all MAPEI products.

MAPEI Americas

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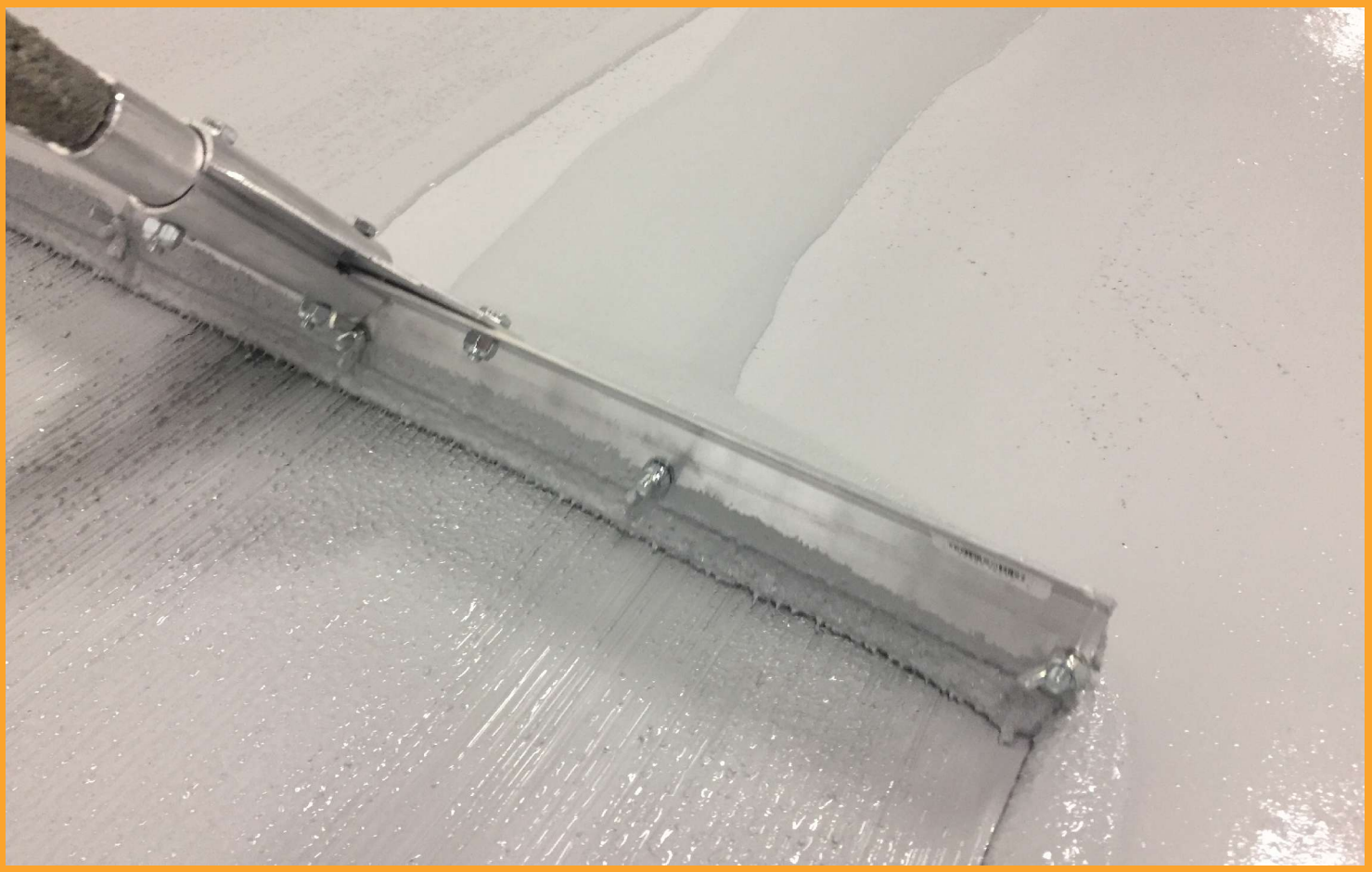

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