CONCRETE REPAIR
BULLETIN
July/August 2017
Vol. 30, No. 4
A Bimonthly Publication of the International Concrete Repair Institute

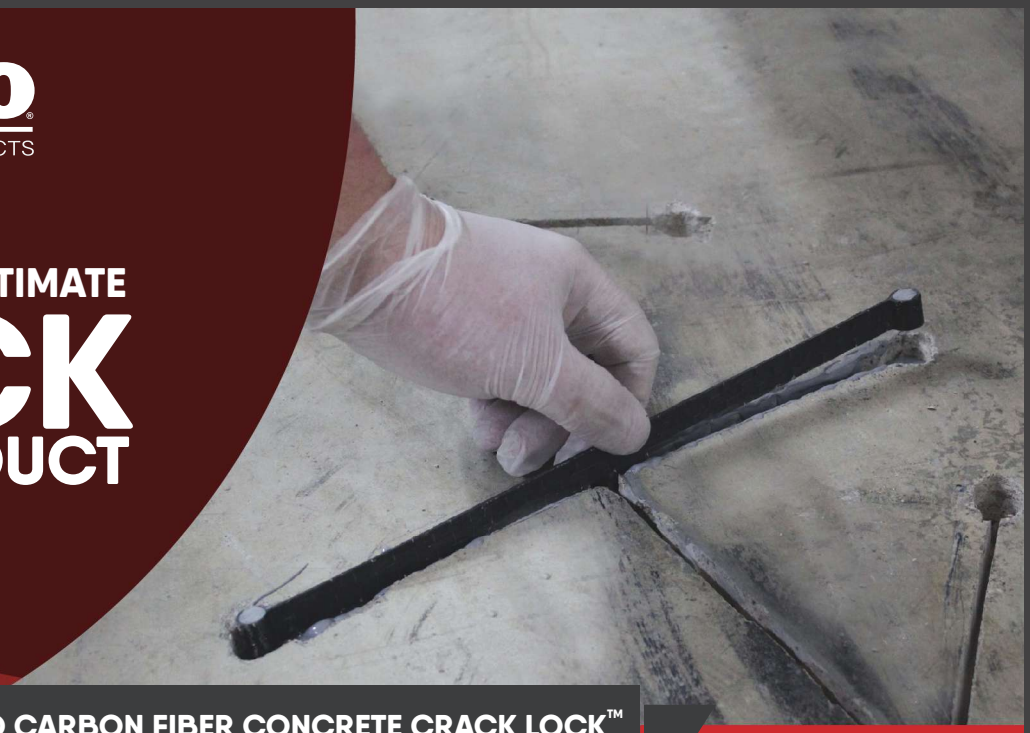
SPORTS FACILITIES

ICRI
INTERNATIONAL
CONCRETE REPAIR
INSTITUTE

RHINO
CARBON FIBER REINFORCEMENT PRODUCTS

INTRODUCING **THE ULTIMATE**

CRACK REPAIR PRODUCT



RHINO CARBON FIBER CONCRETE CRACK LOCK™

- Stronger Repairs
- Less Intrusive
- Cost Effective
- Reduced Service Calls
- Faster and Cleaner Installation

Introducing a revolutionary new concrete repair product designed to make crack reinforcement more efficient and less labor intensive.

Ultimate versatility

The Concrete Crack Lock is uniquely engineered to permanently stop cracks in concrete slabs, poured walls, masonry, concrete block foundations, columns, industrial buildings, bridges, foundations, swimming pools, as well as in preparation for floor coatings.

Additionally, it is designed for cracks of various sizes under virtually any circumstance and can even be used to increase seismic strength to repairs after an earthquake. Another benefit is the minimal aesthetic impact of the repair which can easily be painted over or covered with a finishing product.

Complete CFRP solutions

MEMBER OF INTERNATIONAL CONCRETE REPAIR INSTITUTE

1-888-684-3889 www.rhinocarbonfiber.com info@rhinocarbonfiber.com

Concrete Repair Bulletin
is published bimonthly by:
International Concrete Repair Institute
1000 Westgate Drive, Suite 252
St. Paul, MN 55114
www.icri.org

For information about this publication or about membership in ICRI, write to the above address, phone (651) 366-6095, fax (651) 290-2266, or email info@icri.org. The opinions expressed in *Concrete Repair Bulletin* articles are those of the authors and do not necessarily represent the position of the editors or of the International Concrete Repair Institute.

CRB EDITORIAL DEADLINES

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

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

January/February 2018—November 1, 2017
Theme: *Repair In New Construction*

INTERNATIONAL CONCRETE REPAIR INSTITUTE

ON THE COVER: Chase Field, home of the Arizona Diamondbacks. See page 16 for article by Dennis Wipf.

CONCRETE REPAIR BULLETIN

July/August 2017
Vol. 30, No. 4

FEATURES

DEPARTMENTS

NOTE FROM THE EDITOR

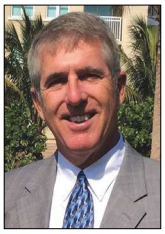
Summer has arrived and the Concrete Repair Industry is now in full swing for the 2017 construction season. ICRI will be putting on Concrete Slab Moisture Testing Technician Certification Programs throughout the year and will be hosting a Technical Track at the NACE Concrete Service Life Extension Conference at Columbia University in New York City, June 27-29, 2017.

ICRI is forming a *Concrete Repair Bulletin* (*CRB*) Advisory Board to help determine the direction the industry magazine, as well as other ICRI publications, will take in the future. The Board will help determine future magazine themes, suggest future articles, identify potential authors and help procure articles. ICRI is always looking for articles. Information on topics and article guidelines is available on the ICRI website.

This month, the *CRB* theme is Sports Facilities. Sports Facilities vary greatly in design, construction and weather exposure. Facilities are often major construction projects that are usually built with a combination of Public and Private financing. They are used for many different events ranging from sports to concerts and many others. Repair and maintenance require extension planning to meet budget and operational constraints that are typically different for each venue. This month we feature an article on Condition Assessment and Capital Planning, a long term repair case study, and a recent stadium repair program.

Jerry Phenney
Editor, CRB
MAPEI Corporation

PRESIDENT'S MESSAGE


BRIAN DALEY

I hope this edition of the CRB finds all members of the International Concrete Repair Institute healthy, busy and profitable.

ICRI's Executive Committee and I are very pleased to announce that we have recently signed a new Memo of Understanding (MOU) with the American Concrete Institute. Its purpose is, "...to recognize past cooperation, to express mutual ongoing intent for clear and open communications between our organizations, and our commitment to work cooperatively to the betterment of the concrete repair industry." The MOU expresses the visions that ACI and ICRI have for each of our roles in the world of concrete repair. It also affirms our joint commitment to collaboration between technical committees, on publications, educational products, seminars and certification programs. This MOU supersedes an earlier memo of understanding between ACI and ICRI, and establishes a new agreement on the part of leadership of both groups to eliminate duplicate efforts, and to utilize the best knowledge and experience of all of our members to our mutual benefit.

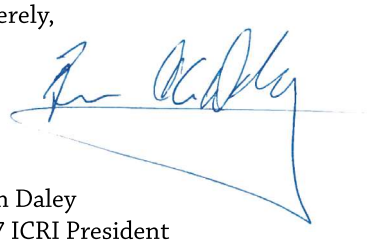
Because ACI will maintain responsibility for development of codes, standards and specifications in mandatory language, ICRI members and committees may have the opportunity to consult on and influence pending code language which will impact the work and products of our members. This new MOU confirms our intent to communicate frequently and actively seek opportunities for joint efforts. ICRI's Executive Committee encourages all ICRI chapters to, likewise, reach out to local ACI chapters and build off this international MOU to establish or strengthen working relationships at the local level. ICRI and ACI share many philosophies and goals, and have many mutual members.

It is exciting to know that ICRI will continue to work in partnership with ACI to grow and improve our industries. Special recognition is due to Khaled Awad, ACI President, and Ronald Burg, ACI Executive Vice-President, for their shared commitment to this agreement, as well as the 2017 ICRI Executive Committee, ICRI Executive Director Mike Levin, and ICRI Technical Director Ken Lozen, all of whom spent significant time reviewing initial versions of the MOU prior to its execution.

The memo of understanding with ACI is just the latest example of an ongoing effort over the last several years by ICRI to achieve working relationships and partnerships with other industry organizations where synergies may exist. ICRI currently has in place or is working on memos of understanding or other formal agreements with the American Society of Civil Engineers, the Building Owners and Managers Association, the Flooring Contractors Association, the PreCast Institute, the Post Tension Institute, the National Association of Corrosion Engineers, the Association for Preservation Technologies and several other groups. Our goal is that with each of these organizations, ICRI can share information, products, committee work, publications, webinars and other efforts. There is much overlap between work activities of our members and those of these other organizations—so the more efficient we can be in developing best practices by working together, the more ICRI members benefit. We believe these strategic alignments will continue to help propel ICRI to be the recognized source of industry best practices and professional networks in the repair industry!

Best wishes for a fun and productive summer of 2017!

Sincerely,



Brian Daley
2017 ICRI President

ICRI INFORMATION

UPCOMING ICRI DATES & EVENTS

CERTIFICATION CLASSES

Concrete Slab Moisture Testing Certification Program

- September 27-28, 2017—Baltimore, Maryland area
- November 7-8, 2017—Denver, Colorado area
- October 3-4, 2017— Pompano Beach, Florida

2017 ICRI FALL CONVENTION

November 15-17, 2017
Theme: "Docks, Locks and Canals"
Hyatt Regency New Orleans, New Orleans, Louisiana

YOU CAN FIND MORE INFORMATION ABOUT THESE AND OTHER ICRI PROGRAMS ON OUR WEBSITE, **WWW.ICRI.ORG**.

OSHA requirements are here.
Is your adhesive ready?

Bosch Speed Clean
DXS dust extraction system

Meet building codes and comply with new OSHA silica dust regulations with Simpson Strong-Tie® AT-XP® and SET-XP® adhesives. As the only adhesives code-listed and load-tested with the Bosch® Speed Clean™ DXS dust extraction system, they deliver reliable performance in your concrete anchor applications.

For the best-in-class solution for dust control, look to the Simpson Strong-Tie | Bosch Alliance. To learn more, visit **go.strongtie.com/oshasilica** or call (800) 999-5099.

SIMPSON
Strong-Tie®

CERTIFICATION PROGRAM

ICRI

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

CONCRETE SLAB MOISTURE TESTING

UPCOMING 2017 CERTIFICATION CLASS:

SEPTEMBER 27 & 28 Baltimore, MD Area	**NOVEMBER 7 & 8** Denver, CO Area	**OCTOBER 3 & 4** Pompano Beach, FL

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

New **Q-Max Pro Concrete Mix** is the first and only concrete mix to deliver one-hour working time, three-hour walk-on time, and 6500 PSI compressive strength. With superior workability plus crack resistance, freeze-thaw durability, and corrosion resistance. **Quikrete.com.**

QUIKRETE®

WHAT AMERICA'S MADE OF.®

CEMENT & CONCRETE PRODUCTS™

SUPPORTING MEMBERS

3M
Saint Paul, Minnesota
www.3m.com

C.A. LINDMAN INCORPORATED
Jessup, Maryland
www.calindman.com

HD SUPPLY CONSTRUCTION & INDUSTRIAL WHITE CAP
Norcross, Georgia
www.whitecap.com

A.H. Harris & Sons, Inc.
AH HARRIS
CONSTRUCTION SUPPLIES
West Hartford, Connecticut
www.ahharris.com

CPR saving the life of concrete®
Baltimore, Maryland
www.concretecpr.com

HMI®
Manitowoc, Wisconsin
www.hmicompany.com

APT
Harmony, Pennsylvania
www.advpolytech.com

CSI CONTRACTING SPECIALISTS INCORPORATED
Attleboro, Massachusetts
www.contractingspecialists.com

HORSE
Shanghai, China
www.horseen.com

AQUAFIN
Elkton, Maryland
www.aquafin.net

CORTEC CORPORATION
Environmentally Safe VpCI™/ MCI® Technologies
Saint Paul, Minnesota
www.cortecvci.com

KENSEAL CONSTRUCTION PRODUCTS
A DIVISION OF AH HARRIS
Baltimore, Maryland
www.kenseal.com

BASF
We create chemistry
Shakopee, Minnesota
www.buildingsystems.basf.com

EUCLID CHEMICAL
Cleveland, Ohio
www.euclidchemical.com

LymTal International, Inc.
Atlantic Beach, Florida
www.lymtal.com

BENGOA CONSTRUCTION
Hollywood, Florida
www.bengoaconstruction.com

EVONIK INDUSTRIES
Parsippany, New Jersey
www.protectosil.com

MAPEI®
Deerfield Beach, Florida
www.mapei.com

BONDED®
Pro-Line by BONDED
Kapolei, Hawaii
www.bondedmaterials.net

GRACO®
Minneapolis, Minnesota
www.graco.com

MINOVA
Georgetown, Kentucky
www.minovaglobal.com

SUPPORTING MEMBERS

INTERNATIONAL CONCRETE REPAIR INSTITUTE

MIRACOTE
A Division of Crossfield Products Corporation
Rancho Dominguez, California
www.miracote.com

SCHÖNOX
HPS North America
Florence, Alabama
www.hpsubfloors.com

TEKNA CHEM
Renate, Italy
www.teknachem.it

PROSPEC
Aurora, Illinois
www.prospec.com

SHERWIN-WILLIAMS
Cleveland, Ohio
www.swconcretecoatings.com

TENNANT COATINGS
Chicago, Illinois
www.tennantco.com

PULLMAN
A Structural Group Company
Columbia, Maryland
www.pullman-services.com

Sika
BUILDING TRUST
Lyndhurst, New Jersey
www.sikausa.com

UFLOOR INC SYSTEMS
Aurora, Colorado
www.ufloorsystems.com

COMMERCIAL GRADE QUIKRETE
Atlanta, Georgia
www.quikrete.com

SIMPSON Strong-Tie
Pleasanton, California
www.strongtie.com

VECTOR CORROSION TECHNOLOGIES
Winnipeg, Manitoba, Canada
www.vector-corrosion.com

RESTORATION EAST LLC.
Baltimore, Maryland
www.restorationeast.com

struc'tur'al
Columbia, Maryland
www.structural.net

W. R. MEADOWS SEALTIGHT
Hampshire, Illinois
www.wrmeadows.com

saveto
vetonit
Riyadh, Saudi Arabia
www.saveto.com

SSRG
Structural Systems Repair Group
Cincinnati, Ohio
www.ssrg.com

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

TACTALK

TAC'S ROLE IN ICRI

FRED GOODWIN

This article is my second of many upcoming articles in the CRB that will expose our members to what is going on within the ICRI technical committees. With each publication, one or two projects currently moving through TAC will be covered. The purpose of the articles will be to not only inform members of our current technical activities, but also to get more members involved in the creation of our technical offerings. This issue will start by making sure everyone understands TAC and the role it plays in our organization.

The Technical Activities Committee (TAC) recommends, implements, and oversees technical activities consistent with policies established by the ICRI Board of Directors. TAC consists of the Chair, twelve members, a Secretary, and the ICRI Technical Director (non-voting staff member). TAC members are appointed by the TAC Chair to three-year terms and can be reappointed for one additional term. Appointments are based on balancing diversity amongst Contractors, Engineers, and Manufacturers, comprising the majority of our membership. One-third of the members are appointed or reappointed each year.

Technically, TAC is an administrative board committee of ICRI whose functions include monitoring and oversight of all technical activities for content, progress, and compliance with approved policies as listed in the Technical Committee Manual (TCM). Activities include review of new and reapproval of existing documents for use by the concrete repair industry as well as oversight of convention technical sessions, including selection of speakers and session moderators.

The TAC Chair is appointed to a three-year term by the ICRI President, subject to approval by the Board, and can be reappointed for one additional term. The TAC Chair is also a non-voting member of the ICRI Executive Committee and Board of Directors; assists the Secretariats in coordinating ideas suggested to ICRI; and is a Vice Chair of the Coordination Committee whose members consist of the Chairs of all technical and administrative committees, the Executive Committee, Secretariats, and the ICRI Executive and Technical Directors (non-voting staff members). The TAC Chair also appoints Technical Committee Chairs that are then approved by the members of TAC.

Each TAC member is assigned liaison responsibilities for a technical committee. This member is designated as the TAC contact, and is listed on the committee roster as such. Contacts are expected to keep TAC aware of the technical committee's activities as well as help the committee with their tasks. Technical Committee Chairs should keep the TAC contact fully informed on committee activities and progress and are encouraged to contact them for advice or information.

TAC recently adopted improvement to the document review process for technical documents to better facilitate document development. A TAC subcommittee was recently appointed to conduct a detailed review of the current document development process and propose revisions as appropriate for TAC consideration. The goal of this subcommittee is to expand current guidance to include details on types of technical offerings from technical committees other than printed media and to streamline the overall production process. This process is intended to be used by technical committees from the beginning to the end of the development process.

TAC also updates the ICRI Technical Committee Manual (TCM) and Concrete Repair Terminology (CRT). TAC has recently formed subcommittees to continue to improve these documents as our organization changes and improves. TAC is always looking for ways to improve and streamline committee procedures. Any comments are welcome. The TCM contains the rules and guidance for technical committees. If there are questions about procedures for technical committees, the TCM usually has the answers. The TCM can be downloaded at https://committees.icri.org/wg/ICRI/document/download/1204 from the ICRI Causeway site described in last month's TAC Talk posted at: http://www.icri.org/resource/resmgr/crb/2017mayjun/CRB_MayJun2017.pdf.

Concrete Repair Terminology (CRT) contains definitions for many common terms used in our industry and especially those in ICRI technical publications such as our guidelines. A copy of this document is available to anyone visiting the ICRI site at http://www.icri.org/?page=terminology_A. When someone wants to know what a particular word or phrase means to ICRI, this is the first place to go.

Technical Committee Chair appointments and reappointments are among TAC's most critical responsibilities, but TAC requests and considers the advice of the current committee chairs. There are currently eleven technical committees whose chairs serve a term of two years usually expiring at the ICRI spring convention. Chairs can be reappointed for three terms of two years each, but unusual circumstances are required to justify reappointments beyond this in order to keep fresh ideas flowing and share the leadership responsibilities.

One of the most important functions of TAC is the review of technical documents and products. TAC reviews documents and products for technical correctness, conflicts with other ICRI documents, compliance with ICRI format, and clarity of text. The TAC review chief (usually the TAC Secretary) facilitates reviews of documents submitted for TAC review and approval for publication. Each document is assigned to a TAC review group that is composed of a review chief plus a minimum of three other TAC members. Outside reviewers may also be appointed to the review group. Outside reviewers are experts on the subject matter who are not on the committee that wrote the document.

Look for future TAC Talk articles outlining current technical committee activities, including the development of educational/certification products and guidelines/documents. See where your interest and expertise can lead to your involvement in these activities to benefit the concrete repair industry.

If you have any questions regarding TAC or want to get more involved in any of our technical committees, please feel free to contact me directly at fred.goodwin@basf.com. ■

***Fred Goodwin** is Chair of the ICRI Technical Activities Committee (TAC).*

Protectosil®

Water Repellents, Corrosion Inhibitors, Graffiti Control & Crack Sealers

Protectosil®

Protectosil® CHEM-TRETE
Protectosil® AQUA-TRETE®



Protectosil® CIT



Protectosil® ANTIGRAFFITI



Protectosil® Degadeck® CSS



Protectosil® Water Repellents

- Penetration deep into the substrate
- Treated structure remains breathable
- UV resistant

Protectosil® CIT

- Extends the service life of the structure
- Easy and low-cost spray-on application
- Anti-spall or corrosion monitoring warranties available

Protectosil® ANTIGRAFFITI

- Repels graffiti and aids in removal
- Withstands repeated cleaning cycles
- Lower maintenance cost

Protectosil® Degadeck® CSS Crack Sealer

- Excellent crack penetration
- Cures within two hours
- Extends service life of concrete structures

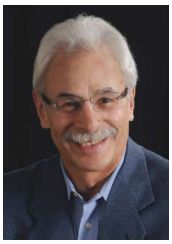
Learn more about our comprehensive line of Protectosil® products including water repellents and anti-graffiti treatments.

Evonik Corporation
Building Protection
299 Jefferson Road
Parsippany, NJ 07054-0677
PHONE +1 800 828-0919
info.protectosil@evonik.com
www.evonik.com/protectosil

EVONIK
POWER TO CREATE

SECRETARIATUPDATE

BUCKLE UP AND HOLD ON TO YOUR HAT. ICRI IS ON THE MOVE!



RICK EDELSON

By now, you have heard about the Secretariat and its mission to assure that members' ideas and issues are heard, disseminated, and managed by the appropriate ICRI committees and task groups. An amazingly simple, yet powerful endeavor. During our first few months of existence, we have received, as of the writing of this article, 26 ideas from members, many of which have now become initiatives for ICRI. Some initiatives have created task groups, some are creating webinars, and some have initiated the creation of new certification programs. Others have simply suggested better ways to do business.

You ask, what are these ideas? How do I see them? We have promised to be transparent.

So, that's the beginning of the move. The next move is to make this process completely visible to everyone. It's now as easy as two clicks. On the ICRI website, click on the Secretariat Committee link, then click the IDEA Summary button in the middle of the page. An image of the summary is shown below.

ICRI Secretariat IDEA Summary

Share |

This table is for informational purposes only.

STAGE 1				STAGE 2			STAGE 3			STAGE 4	
IDEA ID	Date Submitted	Submitted By	Overview - Review Idea Form	Action by Sec.	Date Accepted	Sec. Rep	ICRI Committee	Contact	Current Progress Summary	Status	Closed Date
2016-001	6/10/2016	Greg Blaszak (CMTE 330)	FRP Certification	Accept	6/24/2016	Jeff Barnes	CMTE 330		Follow up with T. Donnely with task group creation	OPEN	
2016-002	6/10/2016	Todd Allen/Dennis Wipf	Bond Pull-Off Webinar	Accept	6/24/2016	Rick Edelson			Power Point slides (technical content) being developed in 210 Subcommittee: Kevin Michols, Chair; Matt Sherman; Peter Kolf; and Jim McDonald Committee 210C held meetion on 5/1/17 and is currently working on Version 7 Education Committee will be forming a new subcommittee (admin) or may use existing subcommittee formed at the 2017 Spring Convention for standardizing ICRI Educational Products, including webinars	OPEN	
2016-003	6/19/16	Rick Edelson	Data Sheet Protocol Merger w/ACI	Accept	6/24/2016	Rick Edelson			Waiting on October meeting	OPEN	
									Mike Levin is contacting		

Take a look. We have received fantastic ideas generated by our members. Are you interested in being involved with any of these? No problem, contact the appropriate task group or committee to jump in.

But, it gets better. IDEA 17-008 submitted by Scott Harrison of the Education Committee brought to light a problem faced by the Education Committee and states, "We need to have a master calendar of ALL educational products in development, planned and proposed, coming out of committees. This calendar should be updated regularly and kept on the website so that ALL committees can review and allow for adequate

time to plan for the financing, pricing, marketing, production and follow up items."

After review of the issue, it was realized that all of our committees and individual members have this very same desire. This idea was accepted and now has been expanded to enhance our Coordination Committee. That's right, the Coordination Committee. Unless you attend the ICRI Conventions and are a Committee Chair, you have probably never heard of the Coordination Committee. The ICRI website provides a description of the Committee: "The Coordination Committee is made up of the TAC Secretary, all ICRI Administrative Committee Chairs, all ICRI Technical Committee Chairs, and members of the Technical Activities Committee. This committee is designed to facilitate harmonization of document development and committee operation process between ICRI committees."

So, here's the big move. The work of the Secretariat is expanding to create a vehicle through which all ICRI Committees can interact with each other. The expansion is the inclusion of the Coordination Committee to be under the guidance of the Secretariat with the creation of a master calendar showing the activity of all ICRI committees and initiatives. A simple idea with a great impact on improving ICRI. Some portions of this master calendar are already in a table created by Jim McDonald—part of his duties as the TAC Secretary—that documents the activities of our Technical Committees. This table is for the exclusive use of TAC. The table will expanded to include all committee and Secretariat initiatives as well as including schedules with milestones. This new chart, updated regularly with status updates and expected milestone dates, will allow everyone to view the activities of every ICRI Committee and every idea generated by ICRI members.

As I said when I started this article, buckle up and hold on to your hat. ICRI is on the move! ■

__Rick Edelson__ is an ICRI Secretariat, Chair of the Coordination Committee, and Member of TAC.

Waterproofing & Protection with MPC Park Deck

Two-component, polymer-modified, cementitious traffic-deck waterproof coating

- Concrete slabs on-grade
- Concrete decks over metal pan
- Concrete topping slabs over sandwich membranes
- Precast concrete parking structures
- Ramps and helixes
- Excellent for use on parapets, columns and vertical surfaces
- Concrete toll booth lanes
- Truck loadings docks and aprons

MIRACOTE

Please visit our website for more information on MPC Park Deck.

miracote.com

Crossfield Products Corp. | miracote.com | 800.692.3502 | miracote@cpcmail.net

Sports Venue Assessment and Capital Planning

BY SPENCER LIVERMORE AND RANDAL M. BEARD

Fig. 1: View of ballpark along riverfront

New sports venues are appearing at an accelerated pace across the United States with new facilities being constructed in a major city approximately every 10 years. These new facilities are complex engineering and construction projects, typically costing hundreds of millions to over a billion dollars to design and construct. With the vast funding and resources being used to build these stadiums, periodic evaluation and long-term maintenance plans are needed to ensure that these new stadiums have an extended service life and are maintained to bolster the fan experience.

Sports venue assessments and capital planning will not only keep iconic stadiums and venues open for extended periods for the public to enjoy, they also have the potential to lower overall costs for the local economies required to build and maintain these massive structures. The owners and the public will benefit in the long-term by allowing funding to be more efficiently used for other critical infrastructure modernization and repair.

Condition Assessment

One of the methods used to educate and inform existing venue management is to provide structural and building enclosure assessments for existing facilities. The ultimate goal of the assessments is to provide venue executive leadership and operations management with a condition appraisal, conceptual repair methods, quantities of repairs, and a plan to keep their facilities in top-notch condition and in operation for years to come. Typical distress items discovered during these assessments include the following:

- Restraint cracking and general cracking of the slabs and other structural components;
- Concrete spalling at walking surfaces, corners, embeds, and railing connections primarily due to low cover over reinforcement;
- Expansion joint failures and leakage;
- Severe wearing of various protective systems such as traffic coatings;
- Sealant damage and leaking joints; and
- Failure of previous repairs.

In 2016, three structural assessments were conducted in Pittsburgh, Pennsylvania involving a football stadium—Heinz Field, a ballpark—PNC Park (Fig. 1), and PPG Paints Arena. Conditions common to stadiums, ballparks and arenas were observed, evaluated, and prioritized into a long-term capital asset management plan (CAMP) for use by each facility. The assessments included both visual and nondestructive

testing of typical conditions affecting structural elements such as concrete and structural steel, through the use of traditional assessment methods and much more challenging non-traditional techniques such as rope access (Fig. 2 and 3). Rope access techniques involve the use of rope and rigging systems to access portions of the structure otherwise inaccessible or costly to access by typical methods such as swing stage, power climbers, man-lift, and frame scaffolding. During the assessments, existing distress conditions were documented and prioritized for immediate and future repair/maintenance, and budgets were established for short-term and long-term future planning purposes. Sports venue assessments and capital planning reports are considered a road map to effective planning and fiscal management of sports venues, thereby keeping them in great condition for future seasons to come.

Fig. 2: Rope access was used to visually review lighting mast steel connections close up

Field Testing

In completing assessments of sports venues with variable service life, it is sometimes necessary to evaluate non-typical conditions. The most effective method to accurately provide project repair and maintenance budgets is to have an experienced engineer, qualified in providing diagnostics and structural assessment, periodically assess the venue by walking and recording visual observations throughout the facility. This should be done in annual or up to five-year cycles, dependent on the age, level of maintenance, and typical volume of use of the venue.

Fig. 3: Rope access was used to access the underside of precast seating risers to visually review structural steel connections and precast concrete surfaces

To adequately evaluate these conditions, field testing of materials and structural elements is often required to obtain and analyze an adequate amount of data to make informed decisions. Confirmation of observed distress and related deteriorated conditions by either nondestructive testing (NDT) or materials testing is typically necessary. Concrete testing that may be considered during a condition assessment includes compressive strength, chloride content, and petrographic evaluation that can determine the overall quality of the concrete in a variety of environmental conditions. These are critical in evaluating the long-term durability and overall condition of the structural members.

The importance of NDT should not be overlooked, especially in situations that require minimizing risk to venue patrons. This type of testing is efficient and accurate and can quickly confirm actions requiring immediate attention. An effective guideline for NDT in primarily concrete venues can be found in ICRI Guideline No. 210.4 [1], *Guide for Nondestructive Evaluation Methods for Condition Assessment, Repair, and Performance Monitoring of Concrete Structures*.

Fig. 4: Load testing of typical handrail

The use of NDT on handrails exemplifies the importance of NDT (Fig. 4). It can be difficult to visually determine if existing handrails can resist the code prescribed forces. However, this can be verified through NDT by testing handrails in locations that visually appear to have some evidence of distress, or testing handrails in locations throughout the facility that are most susceptible to degradation or damage over time (Fig. 5). Some areas that are susceptible to damage may include

Fig. 5: Typical concrete and handrail damage that occurred over time

Fig. 6: Example of monitoring for replacement of deteriorating concrete repair where past repairs are critical to extending the long-term service life of the structure

Fig. 7: Example of failing traffic coating spanning over a crack that when identified promptly for repair will improve the performance of this critical protective system

handrails along ramps and locations that are continuously exposed to weather. This type of NDT in existing facilities is essential to confirm the required capacity of the handrails and ensure that patrons are safe.

Analysis and Repair

Adequate levels of maintenance and repair programs are necessary due to the fact that deferring maintenance and repair of deteriorating conditions often leads to long-term increases in maintenance costs as sports venues continue to age. In addition, repair and maintenance costs may also increase due to past repairs not using properly engineered and specified concrete repair material products, crack sealants, and protective waterproofing traffic coatings and sealers. Structural concrete, concrete walking surfaces, and the protective systems used in large sports venues can perform well if maintained. In high-service areas such as concourses and bowl seating steps, the concrete surfaces suffer greater amounts of distress and require more concentrated maintenance efforts.

In stadiums and arenas, distressed items typically do not result in significant structural issues in the short-term, but if not dealt with early and properly, can become larger long-term issues. The selection and installation of correct repair materials is crucial to ensure that the repairs are both durable and appropriate for the varying types of distress.

Cracking is a common distress condition that occurs in all concrete structures or concrete slab construction when concrete experiences excessive tensile forces. Cracking alone does not typically represent a significant structural issue; however, once cracking occurs, a path for water to reach occupied or enclosed spaces is created. If the cracks are not repaired, concrete spalling may occur due to the corrosion of reinforcing steel. If the crack is considered by an engineer to be structural in nature, a decision to identify the cause and severity of the cracking is necessary. Reasonable repair options can include routing and sealing of cracks with a flexible sealant (urethane or silicone), and in the case of structural cracking, the use of epoxy injection. Some structural cracking potentially warrants additional strengthening, but this must be determined by a qualified licensed design professional.

Concrete spalling along cracks typically occurs when cracking has not been repaired in a timely manner. Due to open environmental conditions at some venues, the application of a specialty repair material or protection to the reinforcement is necessary, as well as proper surface preparation to promote good bonding characteristics of the repair material and the prepared concrete surfaces. Proper surface preparation and repair geometry are crucial in the successful long-term performance of repair products.

Service Life

Venue and repair service life can be significantly increased with applications of protective systems such as expansion joints, sealers, sealants, and traffic coatings for concrete members. As with all structures, though, repair service life of

applied materials is finite, as is the service life of the overall structure (Fig. 6). One example is that past concrete repairs must be monitored for performance with expectations for replacement at a point in the future such as 5 to 7 years after initial placement. Traffic coatings are another example of a high performance protective application that eventually deteriorates and requires regular maintenance and budgeting for recoating or replacement. These coatings have a useful service life typically varying from 5 to 7 years dependent on location and amount and/or type of traffic (Fig. 7). An effective publication for the application and maintenance of protective systems is ICRI Guideline No.710.2 [2], *Guide for Horizontal Waterproofing of Traffic Surfaces*.

The service life of a sports venue can be extended if budgeting for repairs and maintenance is accurately forecasted in Capital Expenditure reports. Repairs for concrete and protective systems can be projected with qualified knowledge of the repair types and protective system capabilities.

Conclusion

The primary importance of structural and protective system assessments in sports stadiums and arenas is to ensure they are safe for the patrons who use them. In addition, to make sound fiscal and environment decisions, it is necessary to provide owners and facility operations with sound information that has been evaluated diligently to identify and address the cause of observed conditions.

The importance of adhering to a licensed design professional's specifications, as well as the use of proven manufacturer's materials when conducting repairs, are critical elements of a successful repair program. Following these steps allows contractors to provide realistic bids since project repair and maintenance work will be quantified fairly and accurately using acceptance criteria provided in the construction documents. As a result, the repair program becomes easier to conduct for all parties and the work quality and durability are increased significantly. Repairing conditions as they occur and maintaining these repairs minimizes long-term costs and is an important element for keeping sports venues in great health.

Assessments and capital planning can be used to provide recommendations and alternatives to owners and facility management that will allow these iconic sports venues to operate safely and efficiently for years to come. ■

References

1. ICRI Committee 210, *Guide for Nondestructive Evaluation Methods for Condition Assessment, Repair, and Performance Monitoring of Concrete Structures* (ICRI 210.4-2009), International Concrete Repair Institute, St. Paul, MN, 28 pp.

2. ICRI Committee 710, *Guide for Horizontal Waterproofing of Traffic Surfaces* (ICRI 710.2-2014), International Concrete Repair Institute, St. Paul, MN, 20 pp.

Spencer Livermore *is a Graduate Engineer at Walter P Moore in Dallas and works in the Diagnostics Group that focuses on solving issues with existing structures. He performs field work as well as structural analysis and design for steel, concrete and wood structures. Spencer also provides structural assessments, repairs, retrofits, vibration analysis of existing structures, and is a leader in the challenging access group providing rope access services to clients. As a graduate research assistant, Spencer studied the tsunami design forces for coastal bridges and the material uncertainties on the shock response of sandwich composites. He is a graduate of the University of Washington with a Master of Science in Structural Engineering and a Bachelor of Science in Civil Engineering.*

Randal (Randy) M. Beard, *P.E. (CO), FICRI, MASCE is Principal at Walter P Moore (WPM) in Orlando and leads the Diagnostics Group with more than 35 years of construction and professional experience. Randy's primary interest includes the design and durability analysis of concrete. Types of projects include sports stadiums, parking structures, plazas over occupied space, and above and underground concrete structures and foundations. As a member of WPM's Knowledge Management Committee, he offers ways to incorporate information that crosses over to all teams. He has won numerous project awards over the years as well as being named an International Concrete Repair Institute Fellow. Randy is an active, voting member in many technical committees of the American Concrete Institute and International Concrete Repair Institute where he was also ICRI National President in 2009. Currently, he serves on the Board of Directors of the Concrete Industry Management. He received his Bachelor of Science degree in Construction Engineering from Lawrence Technological University, and is a licensed professional engineer in Colorado.*

Chase Field Repairs

BY DENNIS WIPF

Fig. 1: Interior view of Chase Field

Chase Field (Fig. 1), owned by the Maricopa County Stadium District and managed and operated by the Arizona Diamondbacks Major League Baseball team, has undergone annual structural repair programs from 2011 through 2017. The vast majority of the repairs have been the result of corrosion damage due to frequent cleaning wash-downs after events during its 19-year existence since construction in 1998. The Stadium was built without any type of waterproof protective membrane in seating areas. However, an extensive gutter system, intended not to protect structural elements but to prevent nuisance water damage to ceilings/floors, was installed under the precast concrete joints. As a result, corrosion damage has occurred to the structure as water leaks through the joints, traveling across structural members before entering the gutters.

With a seating capacity of over 48,000, and 5½ acres (2.2 hectare) under the retractable roof, Chase Field is huge, and the damage that has occurred and repairs needed are not isolated to just a few areas. Because they occur throughout the stadium, the repair areas have been prioritized based on levels of deterioration. Because it is impossible to do this extent of repairs with the stadium "open for business," repairs have been performed during the off-season from October to April in localized areas over the last six years, focusing on repairing and protecting all items in that area. However, the off-season is not free of events either. Each year, several major events occur during the off-season, requiring the stadium to be fully operational. Therefore, repairs were phased so that they were complete and seats put back for the event, only to be torn apart the next day. The old saying, "How do you eat an elephant? One bite at a time," applies here. Each year, for the last six years, another piece of this elephant has been repaired.

Problems Prompting Repair

Over the last six years, corrosion-related concrete repairs and waterproofing protection have totaled over $16 milion. How could a stadium in the Phoenix desert require that much

corrosion-related repairs? Moisture infiltration resulted in the corrosion damage to reinforcing steel (rebar), prestressing strands, embedded steel connection plates, structural steel members and their connections, and steel guardrails/handrails. In 2011, when the stadium was only 13 years old, a facility assessment identified corrosion-related damage to concrete and steel members and it has been under repair ever since.

The reason for the corrosion damage was not weather-related or atmospheric. Phoenix is in a hot, dry desert. Stadium cleaning methods include a thorough wash-down with pressure washers that caused severe corrosion damage from the following:

- Frequent wetting/drying cycles (over 100 cleanings per year);
- High temperatures (corrosion rates double for every 18°F [8° C] rise in temperature);
- High chloride contents (salted peanuts shells are dropped onto the floor and washed down during cleanup);
- Inconsistent replacement of joint sealants when damaged or at end of their service life. Failing joints between precast members (both caulk joints and building expansion joints) allowed water infiltration to reach critical structural members and connections (typically preventive maintenance issues); and
- Although the original design did not include waterproofing, it did include an extensive gutter system beneath the precast joints to collect water if joints leaked, diverting the water to uninhabited spaces (Fig. 2). As a result, corrosion damage occurred to the structure as water leaked through the joints, traveling across structural members before entering the gutters.

Many repair methods and materials were used in the repair programs, with careful attention paid to protecting the stadium from future moisture intrusion in the repair areas. Every steel connection, embed plate, rebar, etc., was sandblasted/epoxy-coated, corrosion inhibitors applied, and repair areas covered with a waterproof urethane deck coating. The repairs covered the spectrum of available materials from ready-mix to pre-bagged materials, and utilized many different placement methods.

Fire Protection Complications

Repairs were located in areas requiring up to 3-hour fire ratings. The original fireproofing, although industry standard materials at the time (spray applied cementitious, mineral-wool or gypsum based intumescent coatings), absorbed moisture and held it next to the structural elements, thereby promoting corrosion (Figs. 2 through 5). Repairs included intumescent epoxy coating (¼ to ½ in [6 to 13 mm] thick waterproof epoxy) on all steel raker trusses and threaded rebar anchors to achieve the required 3-hr. fire rating (Fig. 6 and 7). Instead of mineral wool, which absorbs water, fire-rated building-expansion joints or intumescent tape were used at precast caulk joints to achieve floor-floor fire ratings. Because the bottom side of the joint was over the concrete raker beam/wall and inaccessible to caulk from the bottom side, a standard UL rated fire caulk assembly was not possible. An intumescent tape was inserted into the joint, with backer-rod and standard polyurethane sealant installed on the topside, providing the required fire rating.

Fig. 2: Bottom side of seating riser at support—seating riser bearings and seismic restraint plates are visible on the bottom side. Moisture penetration through building expansion joint into mineral wool (each side of L-shaped plate) resulted in severe corrosion. Rain gutter system completely corroded through as it enters uninhabited space.

Fig. 3: Raker truss tieback anchor—connection between steel raker truss and concrete frame with sixteen 1-3/8" (35mm) diameter high strength threaded rebar anchor rods. Connection is completely hidden between two masonry walls in a dead space with leaking precast joint directly above. Spray-applied fireproofing absorbs water and never dries out.

Fig. 4: Threaded rebar anchor nut—Severe deterioration of the nut. Corrosion of the threaded anchor rod is not visible due to fireproofing and debris.

Fig. 5: Threaded rebar anchor—large mound at end of tape measure is peanut shells and debris washed through failed joint above.

Fig. 6: Raker truss tieback anchor connection—overall view of the threaded rebar anchor assembly after initial sandblasting.

Raker Truss Tieback Connections

Large cantilevered steel raker trusses support the first 11 rows of seating at the Upper Concourse and are connected to concrete columns with high-strength threaded rebar. Sixteen 1⅜ in (35 mm) diameter threaded anchor rods are embedded into concrete columns and raker beams to transfer the 200,000 pound (90,720 kg) tension force from the steel raker truss to the concrete. This very critical structural connection is concealed between two masonry walls in a small inaccessible "dead space," with leaking precast caulk/building-expansion joints directly above. The spray-applied fireproofing absorbed moisture, never drying out, promoting corrosion. This connection and associated damage was not readily visible without removing a sheetrock cover, but infiltration was evident in the form of efflorescent stains on the column and raker beam (Fig. 3 through 5).

Raker truss tieback connection repairs consisted of the following:

- Removing all fireproofing;
- Sandblasting all steel to a white metal finish;
- Unscrewing the threaded rebar nuts, one at a time;
- Inspecting for damage and replacing nuts as needed;
- Sandblasting the rods and nuts;
- Coating all elements with epoxy before assembly;
- Re-torqueing nuts;
- Repeating this process 15 more times for other anchors;
- Chipping out original grout across top, exposing four top anchors;
- Applying migrating corrosion inhibitor;
- Replacing grout with epoxy grout;
- Injecting epoxy between concrete column and steel embed plate;
- Coating raker truss and threaded rebar anchors with intumescent epoxy; and
- Installing waterproof flashing to prevent moisture from leaking directly onto the anchor assembly.

Thirty-two raker truss connections occur at the upper seating level. They were investigated, prioritized for severity, and 19 locations repaired. If the rods were severely corroded, repairing them to replace lost cross-sectional area would have been extremely difficult. Fortunately, even though standing water was found in the grout pocket directly above the threaded rebar, none of the anchor rods had experienced enough corrosion that repairs were required to restore the rod's tensile strength. Many nuts were severely corroded and required replacement.

Precast Joints

Much of the work has involved the precast seating risers (Fig. 8), and the structures below them due to leaking joints between the precast sections. Precast seating risers have numerous joints, between ends where they butt together (transverse), and longitudinally between sections. Most of these joints are caulked; however, seven are building-expansion joints. All joints were not maintained on a consistent basis. Damage from frequent power washing, traffic and the ex-

treme Phoenix sun ultraviolet radiation resulted in accelerated deterioration of polyurethane joint sealants and building-expansion joint covers.

Each precast seating riser is supported at its ends by steel raker trusses or concrete raker beams/walls. Water leaking through these deteriorated joints corroded precast connections and the supporting structure. Threaded rebar anchors are directly below these joints, and gutters are located on each side of the concrete raker beams/walls. However, water drips down from the joint, onto the top of the beam/wall, into the precast bearing area, and down the face of the beam/wall, before being collected into the gutter (Fig. 2). Therefore, supporting member damage has occurred.

Precast Connections

Precast members are supported by typical embedded plates at bearings. Bearing plates embedded in precast members, steel shims, and bearing plates in supporting members all experienced various levels of corrosion. Building-expansion joints incorporating sliding bearing assemblies suffered even more deterioration. Repairs varied from simply sandblasting exposed surfaces of the bearings and epoxy coating, to full depth concrete removals in both precast and supporting members to replace bearing plates/pads, sandblast and epoxy coat exposed steel surfaces, and re-cast the section (Fig. 9 and 10).

To restrain seismic loading, a large steel embed plate was cast into the seating riser's horizontal portion directly adjacent to the transverse joints. These seismic connections experienced deterioration in many cases. Often, repairs encompassed both bearing and seismic areas on each row of seating (Fig. 9, 11 and 12).

To protect the repairs against future corrosion, all exposed steel embeds and rebar were epoxy coated, with the second coat also used as a bonding agent. Building expansion joints utilized pre-compressed, silicone-impregnated foam expansion material to provide a long-lasting waterproof joint, with walking surfaces suitable for high-heeled shoes without the need for metal cover plates.

To protect the concrete against moisture infiltration, a urethane deck coating was applied (Fig. 13). The deck coating primer was a super-low-viscosity healer-sealer epoxy, applied by flood coat with sand.

Precast joints have resulted in damage from moisture leaking onto raker trusses, concrete beams and walls, embeds, bearings, seismic connections, other structural connections, and threaded rebar anchors. Accordingly, repair of joints encompassed numerous repair steps, products, and methodologies to properly protect elements from repeated exposure/deterioration.

Prestressed Seating Riser Strand Corrosion

Concrete cracking and spalling was observed on the bottom

Fig. 7: Raker truss tieback anchor connection—completed repair with epoxy intumescent fireproofing to achieve 3 hour fire rating and provide corrosion protection to the beam and threaded rebar anchors.

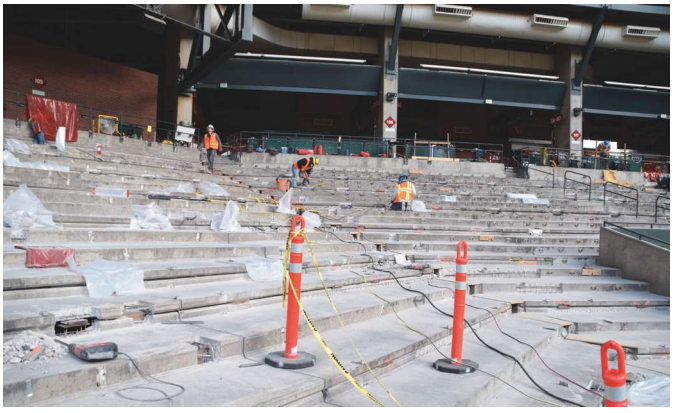


Fig. 8: Repairs to precast seating risers

Fig. 9: Typical precast joint repairs—seismic restraint plate (embed with bolt) and precast bearing seat assembly (below prestressing strands) after existing plates replaced, rebar welded back, and sandblasted prior to epoxy coating and pour back.

side of precast seating risers in two locations. Further investigation revealed corrosion of prestressing strands. Repairs consisted of:

- Installing an epoxy-coated full-length steel channel, bolted to the back side of the seating riser, supporting the weight;

Fig. 10: Concrete column repairs—due to placement logistics, the contractor elected to repair this column rather than replace it.

Fig. 11: Typical Precast Joint Repairs - Water leaking through building expansion joint between precast seating sections was absorbed by mineral wool fireproofing in the joint, resulting in severe deterioration. Large steel plates are seismic restraints.

- Chipping out concrete exposing corroded strands;
- Sandblasting;
- Epoxy coating exposed steel;
- Form and pour back; and
- Protection with a urethane deck coating.

Fortunately, no other seating risers have been discovered with similar deterioration. Ongoing repairs include deck coatings to prevent similar damage.

Other Repairs

Numerous other significant repairs have been performed over the last six years at Chase Field as a result of corrosion due to wash-down, and include the following:

- Hundreds of guardrails/handrails have been repaired due to corrosion at their base;
- Large steel columns (W14x311) which support the retractable roof were coated with a gypsum-based intumescent fireproofing which absorbed water, resulting in substantial corrosion of the columns at the floor line, where over ¼ in (6 mm) of the flange thickness was lost. Fortunately, this was detected early enough that structural repairs were not required; and
- Over 3300 bolts which support the seats required replacement in 2016/2017 due to section loss from corrosion.

Repairs are anticipated to continue in the upcoming years.

Cost Control

A very proactive approach in repairing the stadium was implemented. Through six years of repairs, the Owner has become knowledgeable and sophisticated. One aspect of this has been cost controls, which have been developed and improved each year to more accurately track the repairs, project costs vs. budgets, and add or delete scope of work to meet budget.

Repair drawings were developed with different variations for typical conditions which repeat throughout each year's repair program. Because much of the damage is concealed, it's impossible to accurately predict the level of deterioration for each location, and therefore the associated repair. Typical repair details were developed with two or three different scenarios corresponding to varying levels of deterioration. A typical connection had repair details for minor deterioration, moderate deterioration, and severe deterioration. Each location was identified with an anticipated quantity and level of deterioration. Unit costs were obtained for each item prior to construction. As the repairs progressed, and levels of deterioration were determined, most of the repair details had already been developed for construction and costs established, therefore, eliminating delays in waiting for design and their related costs, greatly streamlining the process.

The $4 million contract in 2016/2017 contained over 150 individual unit cost items. Each unit cost item was identified on the drawings, with careful attention paid to defining the work scope and avoiding overlap. An extensive spreadsheet tracked predicted quantities and locations for each unit cost

repair item, actual quantities and locations, and automatically multiplied these out by the unit costs and projecting the actual total costs to compare with the anticipated budget. The Owner provided the spreadsheet template, and the contractor updated it with actual quantities, resulting in final cost updates weekly. This expedited the monthly payment applications, and identified overall project savings that were rolled into additional scope of work. Because this process streamlined and accurately predicted savings, additional work scope could be added early. Opening day for baseball season does not change, but because additional work scope was added early, the contractor was able to perform and complete it.

While unit costs are not new to concrete repairs, implementing them to this magnitude and sophistication is very unusual. It has been so successful that the general contractor, subcontractors, and engineer are each independently implementing it on other projects in varying degrees.

Fun Facts

Over six years, repairs at the stadium required approximately:

- 1030 gallons (3900 liters) epoxy;
- 1330 gallons (5035 liters) epoxy intumescent fireproofing;
- 5000 bags repair mortar;
- 3420 gallons (12,950 liters) urethane deck coating;
- 625 gallons (2365 liters) sealant; and
- 540,000 pounds (245,000 kg) sandblasting media.

The damage and resulting repairs at Chase Field should serve as a wake-up call to the sports venue industry, because similar conditions exist at other stadiums. ■

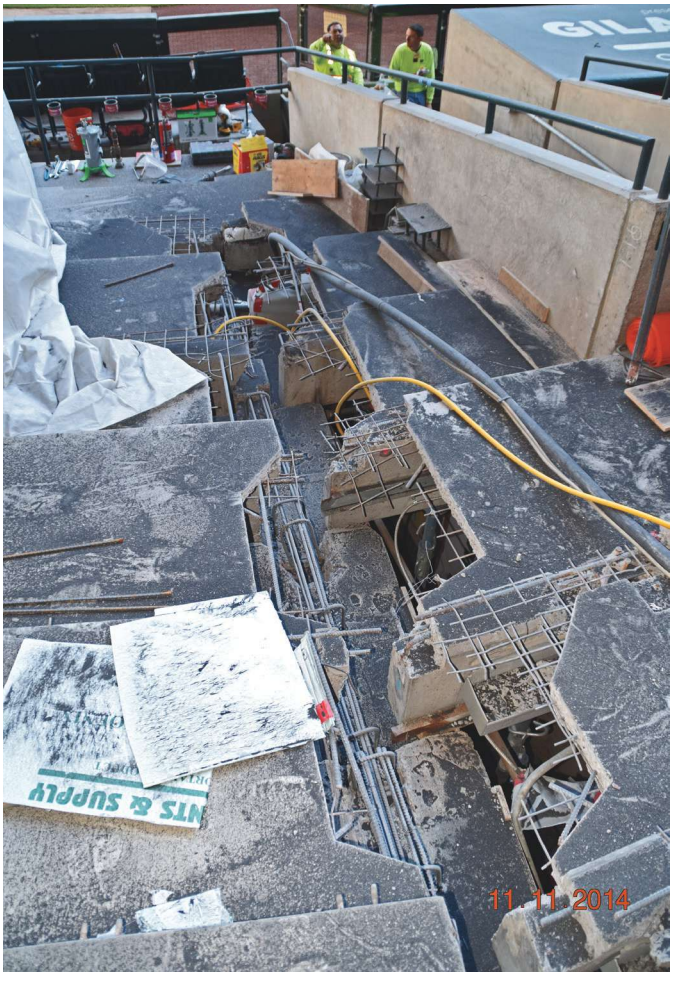


Fig. 12: Precast joint repairs—typical example of demolition required to repair the joints between the precast seating sections. Seismic restraint plates have been completely removed for replacement. Bearing repairs for stems have not started. Virtually every row was affected.

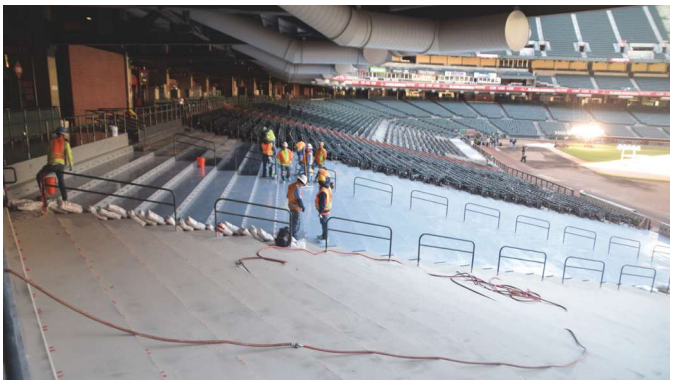


Fig. 13: Deck coating application at precast seating risers.

Chase Field Repairs
Phoenix, Arizona

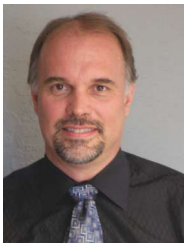
OWNER
Maricopa County Stadium District
Phoenix, Arizona

ENGINEER/ARCHITECT
Gervasio & Associates, Inc.
Phoenix, Arizona

GENERAL CONTRACTORS
Caliente Construction, Inc.
Tempe, Arizona
Jokake Construction
Phoenix, Arizona

CONCRETE REPAIR CONTRACTORS
Restruction Corporation
Tempe, Arizona
Robert E. Porter Construction, Inc.
Phoenix, Arizona

MATERIALS SUPPLIERS
BASF Compamy
Cleveland, Ohio
Cortec Corporation
St. Paul, Minnesota
Euclid Chemical Co.
Cleveland, Ohio
Neogard
Dallas, Texas
Sika Corporation
Lyndhurst, New Jersey



Dennis Wipf, *P.E. is a Structural Forensic Engineer with Gervasio and Associates, a consulting engineering firm in Phoenix, Arizona. He began his 32-year career at Gervasio with the design of new buildings, and has since specialized exclusively in evaluations and repairs of concrete structures. He has received six awards from ICRI for outstanding concrete repair projects. He graduated from Utah State University with a Bachelor of Science in Civil Engineering in 1985. Wipf is a member of ACI and ICRI, is Co-Chair of the ICRI Evaluation Committee 210, and was instrumental in establishing the ICRI Arizona Chapter where he served as the President and on the Board of Directors. Dennis is also a Structural Specialist on the Phoenix Fire Department FEMA Urban Search and Rescue Team and served on deployments to New Orleans for Hurricane Katrina, and Houston and Galveston for Hurricane Ike.*

Rose Bowl Stadium: Durability and Sustainability at its Best—Concrete Repairs Lasting Almost Two Decades and Going Strong!

BY AAMER SYED AND KURT ANDERSON

Fig. 1: Overview of the Rose Bowl Stadium

When one thinks of iconic sporting venues in the US, there are few larger or more historic than the Rose Bowl Stadium (Fig. 1 and 2) in Pasadena, California. Originally built in 1922, the Rose Bowl Stadium was designed by Myron Hunt, a distinguished local architect whose design was influenced by the Yale Bowl in New Haven, Connecticut. The Rose Bowl game, known as "The Granddaddy of Them All" is the oldest of all college football bowl games.

By 1929, the popularity of college football had grown significantly and the Rose Bowl Stadium underwent the first of many additions and changes that would occur over the years. In 1930, the wood bleachers were replaced with cast-in-place reinforced concrete bleachers with wooden benches. Additional rows at the back of the seating bowl were added, increasing the capacity to 80,000 people.

Over the next 68 years, the Rose Bowl Stadium hosted many prestigious events such as the men's 1994 FIFA World Cup final, five NFL Super Bowls, sporting events at both the 1932 and 1984 Olympic Games, and a variety of concerts. In 1982, it became the home stadium for the UCLA Bruins. In 1987, the Rose Bowl Stadium was recognized as one of the most significant properties associated with the history of sports in the US when it was listed as a National Historic Landmark by the Secretary of the Interior. Yet another honor was bestowed in 2007 when *Sports Illustrated* named the Rose Bowl Stadium the number one venue in college sports.

Eventually, the total capacity of the stadium was increased to over 100,000 people and there have been many additions and upgrades to the stadiums' seating, locker rooms, restrooms, concession stands and press boxes. However, no major repairs were ever made to the concrete structure of the stadium.

Existing Conditions in the '90s Leading to Repairs

The stadium, which has hosted countless events over the years with millions of people in attendance, was starting to show its age. The primary issue to be addressed was the eroded concrete surfaces at the treads and bleachers. There were also large areas of exposed aggregate surface leaving a rough non-uniform concrete surface at these locations (Fig. 3). This condition was partly due to poor consolidation of the concrete when it was originally placed. The second major issue involved corrosion damage of the concrete that had resulted in cracking and spalling of the concrete. The corrosion was partly caused by the lack of concrete cover over the 60-year-old steel reinforcing steel, which was measured at a ½ inch (13 mm) depth in most areas. This low cover did not provide enough long-term protection to the reinforcing steel. Another issue that added to the concrete damage was years of exposure to acids, fats and other by-products from food and beverages that are consistently spilled at sports stadiums (Fig. 4).

Mock-ups: Testing the Repair Options for Five Years

The primary test specified by the engineer to select a repair system was to utilize an on-site mock-up that would be subjected to real world, long-term testing. Several products were chosen for the test and each applied as a cementitious overlay on an individual stair tread that measured approximately 2 ft x 2 ft (0.6 m x 0.6 m). The next phase of the mock-up test was to simply wait. The mock-ups were applied in a high-traffic area in the north end of the stadium and exposed to normal activity for a period of five years. After the five-year period, the different product applications were visually inspected and core samples drilled and sent to an independent testing laboratory for abrasion and bond strength evaluations.

Lab Test Results

ASTM D1242 Abrasion Test	Loss in inches (mm) after 100 cycles	Loss in inches (mm) after 500 cycles
Concrete Control Samples	0.035 (0.89)	0.054 (1.37)
Overlay Specimen	0.020 (0.51)	0.030 (0.76)

ASTM C297 Bond Strength	PSI (MPa)
Overlay Specimen to Concrete	278 (1.9)

Fig. 2: The exterior entrance to the Rose Bowl Stadium

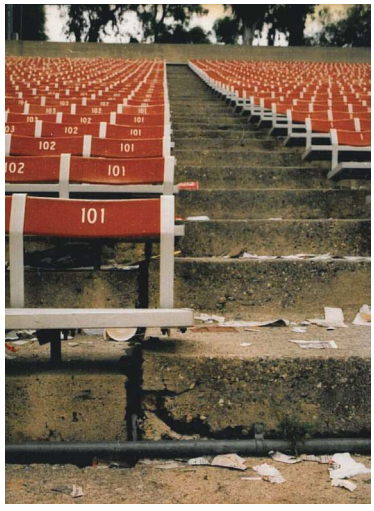


Fig. 3: Large areas of damaged concrete


Fig. 4: Waste left on concrete risers during a football game (stadium cleaned after every event)


Fig. 5: Removing damaged concrete with chipping hammer

Fig. 6: High-pressure water blasting to clean and prepare concrete surface

Fig. 7: Areas of prepared and un-prepared concrete

Fig. 8: The required substrate moisture conditions were achieved by soaking for 24 hours

Fig. 9: Forming concrete risers for repair material installation

Repair System Selected

After the engineers completed the mock-up testing and reviewed the different products that were applied five years earlier, they selected a system approach to repair both the damage of the entire concrete surface and the spalls and cracks caused by the corrosion of the steel reinforcing in the concrete risers and treads. The repair system incorporated the following:

- Cementitious resurfacing/overlay mortar;
- Boding agent with reinforcement protection;
- Cementitious form and pour mortar; and
- Two component polyurethane sealant.

The total area of the concrete to be repaired was in excess of 300,000 sq ft (27,870 sq m) and the total cost of the entire repair project was budgeted for $22.5 million which included all of the concrete repair as well as upgrading the aluminum bench seats to individual flip up seats in the east and west sections of the stadium. A public bond was issued on behalf of the City of Pasadena, so the engineers chose a system that was both economical and would create a long-lasting repair.

Site Constraints

Even though the main function of the Rose Bowl is as a football stadium, it is actually in continual use throughout the entire year, which created some issues with scheduling the repair work. The contractor had to continually rearrange work around the Los Angeles Galaxy, a professional soccer team, the weekly Rose Bowl flea market, and various concerts. The repair work, which began in March 1998, was scheduled in sections so that the stadium could be in semi-continual use; however, repairs needed to be completed by September 12 that year, when UCLA was to host its first football game of the year versus Texas.

Demolition

The repairs at the entire riser and tread interface and various spall locations utilized edge grinders to provide saw cuts and chipping hammers to remove the old concrete surface. The contractor initially used large pneumatic chipping hammers to remove the concrete surface but the original concrete was too brittle and large amounts of the concrete mass were being removed. The contractor then switched to smaller electric chipping hammers (Fig. 5), which were less destructive and removed the required amount of concrete surface. The contractor demolished the old aluminum seating in the east and west areas of the stadium, and had to remove, store and then later reinstall the aluminum bench seating located in the north section of the stadium.

Surface Preparation

In areas of the stadium where the concrete surface had already degraded, leaving large areas of exposed aggregate, the concrete was prepared by using high-pressure water blasting (Fig. 6), a nondestructive method that adequately prepared the substrate for the repair (Fig. 7).

Because the bulk of the repairs were to take place in the middle of the summer, there would be intense heat and wind from the continual direct sunlight as a result of the open bowl shape of the stadium. As such, the contractor took extreme care to ensure that the substrate was properly saturated. To achieve the necessary substrate moisture conditions, the contractor ran oscillating garden sprinklers for a 24-hour period in the specific section that was to be repaired (Fig. 8).

Application Methods and Repair Execution

The contractor investigated a few methods for applying the repair materials in the stadium, including pumping the material. In the end, a fully manual approach was selected to work best because of the large, low incline areas of concrete risers and treads that would be repaired (Fig. 9).

The repair mortars and bonding agent were all mixed in small units and applied by hand. The contractor designed the repair so that one group of laborers would mix the product, one group would apply the product, and the last group would finish the product. This approach would be used around the entire stadium to complete the project in the most efficient manner.

With this repair team approach, the resurfacing/overlay material was applied at ⅛ in (3.2 mm) to ½ in (12.7 mm) thick with trowels and sponge floats (Fig. 10), then the next team would broom finish the application as the initial team moved up to the next riser in the stadium (Fig. 11). In other areas where there was concrete spalling on the tread riser interface, a form and pour approach was used for the repair.

Finally, because the contractor wanted to ensure that there would be no cracking of the overlay material, the large repair areas were cured with saturated curing blankets incorporating burlap on one side and polyethylene on the other side, to keep the repair materials moist while acting as a vapor barrier (Fig. 12). The renovations continued throughout the summer of 1998 with 45 people on the job working ten hour days, six days a week, in order to meet the completion date for the beginning of the college football season.

After the concrete repairs were completed, all of the expansion joints in the stadium were resealed using a two component polyurethane sealant for further protection of the concrete.

2017 Project Update

This year marks the 19-year anniversary of the Rose Bowl Stadium concrete repair project that took place in 1998. Over that time, the stadium has continued to be a highly visible, greatly used sports arena hosting major sporting events and other venues. For the most part, the overlays that were completed in 1998 are intact with only limited repairs performed to the original scope of the work completed almost 20 years ago. The sealant used to fill the joints have shown signs of age but the concrete repairs are performing exceptionally well.

After almost two decades of wear and tear, the repairs that were performed in the stadium in 1998 are withstanding the test of time, and other than dirt pick up, still look the same today as they did when they were implemented (Fig. 13), fulfilling the expectations of the Rose Bowl Operating Company.

Part of the success of the repairs is that a real world, on-site mock-up was put in place and allowed to be evaluated through long-term durability testing. This action allowed the engineer to have the confidence in the repair system that was specified. Another critical part of the success and durability of the project was the great care taken by the contractor to make sure that the concrete was properly prepared and the repair system correctly installed and cured.

Fig. 10: Resurfacing concrete

Fig. 11: Team approach—resurfacing, finishing, and curing

Fig. 12: Large repair areas were cured with saturated curing blankets

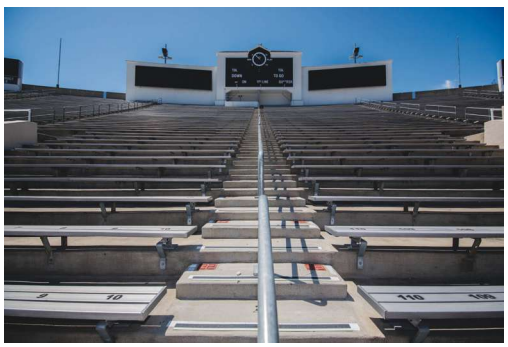


Fig. 13: The Rose Bowl Stadium today—repairs performing after 19 years

Conclusion

The Rose Bowl Stadium repair project is a testament to the fact that when concrete repairs are completed in accordance with the standards set by the industry, they can withstand the test of time and significantly increase the service life of the concrete structure.

Concrete repair, if done right, is a true synonym for sustainability and durability. Many industries are positioning themselves to become the flag bearers of these buzz words. The truth is that, if done right, the concrete repair industry is demonstrating that they contribute and excel on sustainability and durability like no others do. Although there is room for improvement at every stage of evolution in any industry, the concrete repair industry has an advantage that few industries do, and we should continue to build on it! ■

Aamer Syed *is Director Product Management—Refurbishment for Sika Corporation and is based at the Lyndhurst, NJ corporate office. He received a B.S. in Mechanical Engineering in 1995 from NED University in Karachi, Pakistan, and completed his M.S. Management Program at Stevens Institute of Technology in 2003. Aamer's work experience includes representing Hilti Corporation for four years, and joined Sika Corporation in 1998 as a Test Engineer. His current responsibilities include overseeing Product Management of Sika's target market refurbishment products. Aamer is a member of ICRI, ACI, NTPEP, ATSAA and PTI where he participates on various national technical committees. Aamer is also a voting member of ICRI TAC (Technical Activities Committee).*

Kurt Anderson *is District Sales Manager for Sika Corporation's Commercial Refurbishment Products for Los Angeles / Southern California. He started with Sika in January 1989 and has been in the construction industry for over 30 years. With his experience and knowledge in the industry, Kurt has been able to successfully lead his team and customers across his territory. Kurt is an ICRI member and was a former Board Member of the local ICRI Chapter. He is also a member of SEAOSC (Structural Engineers Association of Southern California).*

A WORLD OF QUALITY CONCRETE PRODUCTS

PROVEN. CONCRETE. REPAIR.

Euclid Chemical offers a full line of concrete repair and protection products. When you need a single component, low shrinkage, vertical/overhead repair mortar, choose **EucoRepair V100.**

- Quick Setting
- Extremely Low Shrinkage
- Shapeable
- Microfiber Reinforced
- Trowel Applied
- Freeze-thaw Resistant

For more information, visit euclidchemical.com/repair or call 800-321-7628

EUCLID CHEMICAL

The Euclid Chemical Company • Cleveland, OH • 800-321-7628

www.euclidchemical.com

CONCRETE REPAIR CALENDAR

SEPTEMBER 27-28, 2017
ICRI Slab Moisture Testing Certification
STRUCTURAL Facility
Columbia, MD
Website: www.icri.org

OCTOBER 3-4, 2017
ICRI Slab Moisture Testing Certification
Polished Concrete University Facility
Pompano Beach, FL
Website: www.icri.org

NOVEMBER 7-8, 2017
ICRI Slab Moisture Testing Certification
Arapahoe County Fairgrounds
Aurora, CO
Website: www.icri.org

NOVEMBER 15-17, 2017
2017 ICRI Fall Convention
Hyatt Regency New Orleans
New Orleans, LA
Website: **www.icri.org**

JANUARY 22-26, 2018
World of Concrete
Las Vegas Convention Center
Las Vegas, NV
Website: www.worldofconcrete.com

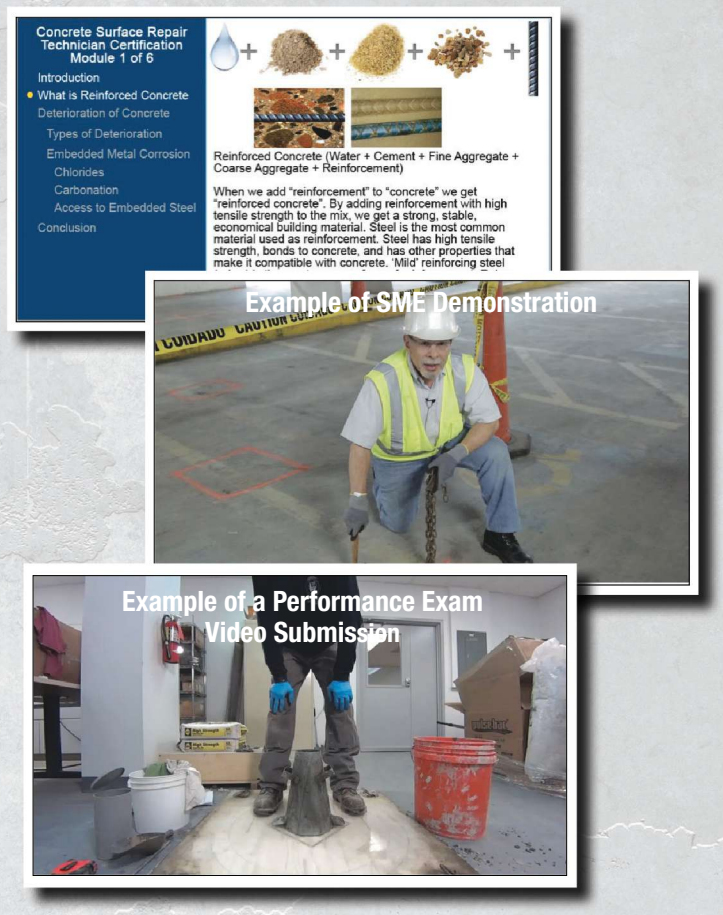
INTERESTED IN SEEING YOUR EVENT LISTED IN THIS CALENDAR?

Events can be emailed to editor@icri.org. Editorial content for the Nov/Dec issue is due by Sept. 1, 2017 and content for the Jan/Feb issue is due by Nov. 1, 2017.

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

The International Concrete Repair Institute has the program for you!

The ICRI Concrete Surface Repair Technician Certification Program



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

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

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

Certification Program Development Resulting from Industry Demand and Code Language

INTERNATIONAL CONCRETE REPAIR INSTITUTE

For more information go to
www.icri.org

ASSOCIATIONNEWS

AMERICAN PUBLIC WORKS ASSOCIATION (APWA) AWARD ANNOUNCEMENTS

2017 Top Ten Public Works Leaders of the Year

APWA's Top Ten Public Works Leaders are recognized for the career service achievements of public works professionals. This year marks the 57th anniversary of the Top Ten Leaders Awards, which is one of the most coveted and prestigious awards presented by the APWA association.

The Top Ten Public Works Leaders program focuses on outstanding career service achievements of individual public works professionals and officials from both the public and private sectors in North America. Each of the Top Ten Leaders are recognized for their accomplishments in federal, state, provincial, county or municipal engineering or administration including career advancement, contribution to technology or job knowledge, commitment to the profession as evidenced by education, training, certification or registration and continuing education, as well as professional excellence and service to the community in large and small municipalities.

This year's APWA 2017 Top Ten Public Works Leaders list includes:

- David Fabiano, P.E., PWLF – Town Engineer, Town of Gilbert, AZ
- Lee Gustafson, P.E. – Senior Project Manager, WSB & Associates, Inc., Minneapolis, MN
- Patricia Hilderbrand, P.E. – Division Manager, Coordination Services, Public Works Dept., Kansas City, MO
- Richard Howard, CFM, P.E., PWLF – Public Works Director, City of Orlando, FL
- Paul May, P.Eng. – Chief Engineer, York Region Rapid Transit Corporation, Markham, ON, Canada
- Robert Newman – Director of Public Works, City of Santa Clarita, CA
- Jeanne Nyquist – President, Nyquist & Associates, Inc., Tigard, OR
- Darren Schulz, P.E. – Director of Public Works, City of Carson City, NV
- Kevin Sheppard, P.E., PWLF – Public Works Director, City of Manchester, NH
- Larry Stevens, P.E., PWLF – Project Director, HR Green, Inc., Johnston, IA

Dixon's Wastewater Treatment Facility Earns Envision Silver Award

Dixon's Wastewater Treatment Facility in California is the recent recipient of the Institute for Sustainable Infrastructure (ISI) Envision Silver award. The Envision sustainable infrastructure rating system verifies the sustainability of infrastructure projects across the full range of environmental, social, and economic impacts.

The City of Dixon's Wastewater Treatment Facility Improvements project is the culmination of years of collaboration between the city, Stantec Consulting, state of California environmental regulators, and the public. Improvements to the facility address a range of community needs, goals, and issues such as upgrading the aging wastewater treatment facility without an undue burden on ratepayers, meeting increased capacity demands, and addressing salinity limits placed on the facility by the state.

Joe Leach, P.E., city engineer/public works director said it's important that smaller public entities receive recognition for their efforts to design and build sustainable projects.

The award, including a commemorative plaque, will be presented to the City of Dixon by the Stantec design team at a City Council meeting on July 11, 2017.

Virginia Beach Park & Recreation's Marshview Park Phase 1 Project Earns the Envision Silver Award for Sustainable Infrastructure

Virginia Beach Parks & Recreation Department's Marshview Park Phase 1 project is the recent recipient of the Envision Silver award from the Institute for Sustainable Infrastructure (ISI). The park is the second project in Virginia to earn an Envision sustainable infrastructure award. The Envision system rates the sustainability of infrastructure projects across the full range of environmental, social, and economic impacts.

The Marshview Park Phase 1 project will provide a 17.9 acre park with recreational amenities open to the public during the day in Virginia Beach. The park will include an eight-foot wide paved trail, fenced-in dog parks, a multi-purpose playing field, and two new parking lots. Picnic shelters, benches, a playground, and a restroom facility are also planned for future development within the park. Associated landscaping, aesthetics, stormwater management, and other infrastructure improvements will also be provided.

Virginia Beach Parks & Recreation worked in close collaboration with Clark Nexsen, a national architecture and engineering firm, to design the Marshview Park Phase 1 project that received an Envision Silver award for sustainable infrastructure. As a collaboration between ISI and the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design, the Envision system rates the impact of sustainable infrastructure projects as a whole. The Envision system measures sustainability in five categories: Quality of Life, Leadership, Natural World, Resource Allocation, and Climate and Risk. These key areas contribute to the positive social, economic, and environmental impacts on a community.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your industry news to editor@icri.org. Editorial content for the September/October issue is due by July 3, 2017 and content for the November/December issue is due by September 1, 2017.

PEOPLE ON THE MOVE


Steve Stoughton

Mara Restoration, Inc., a full-service masonry restoration and preservation contractor specializing in commercial and historic properties, is pleased to announce the addition of **Mr. Steve Stoughton** to its business development and client relations team. As Vice President, Steve will spearhead its "Clients for Life" initiative, and focus primarily on clients seeking a customer service-oriented approach to masonry restoration problem solving.

Steve comes to Mara with over 28 years of experience within the construction industry. He is a graduate of Temple University where he studied Finance and Construction Engineering and Technology. He has been affiliated with a number of trade associations, where he served in various capacities as chairman, board member and mentor. Steve will play a key role in the continued expansion of Mara Restoration.


Jason Porter

NAI, a leading manufacturer of end-to-end connectivity solutions for high performance systems in industrial, telecom, data and medical industries, has announced the appointment of **Jason E. Porter** to the position of Director of Engineering and Continuous Improvement.

Mr. Porter brings over 20 years of experience in engineering, sales, manufacturing and strategic planning for global operations and worldwide markets. He most recently held the position of Director, Global Technology Development with the PKC Group in Farmington Hills, MI. PKC is a manufacturer of individually tailored wiring products that includes thousands of product variants. Porter managed their global portfolio of products, including wire harness systems, electro-mechanical components, vehicle electronics and cable. Prior to that, he held several executive positions at PKC successor companies AEES, Inc and Alcoa/AFL., also in Farmington Hills, MI, and which included a term as General Manager in Shanghai, China.

To accommodate industry demand and corporate growth, **PROSOCO** announces new hires in a comprehensive restructure.

To better develop the potential of strategic alliances with major industry partners, 14-year PROSOCO veteran **Brian Koenings** will transition to a leadership role responsible for the company's Strategic Partnerships that promote the sale of PROSOCO-branded products. Koenings will ensure that PROSOCO's role in each alliance is properly represented through coordinated marketing, collaborative selling, contractor training and field support.

Demian Weaver joined PROSOCO with a prior work history well-suited to his new

role advocating for Strategic Partnerships – Technology. Over the past 5 years, Weaver served PROSOCO as a territory manager in the Mid-Atlantic States. That experience earned him a deep understanding of PROSOCO technologies and the industries PROSOCO serves. These combined experiences will enable Weaver to capitalize on PROSOCO's novel product formulations and production capabilities.

Working from PROSOCO's corporate headquarters in Lawrence, KS, Weaver will coordinate efforts of internal quality assurance, quality control, scheduling, production, purchasing, labeling, regulatory control and logistics on behalf of key strategic partners serving other facets of the marketplace.

Kevin Sigourney has been promoted to the position of Vice President – Brand Integrity, where he will oversee all functions of sales and brand strategy (formerly known as marketing) departments. Sigourney devoted the first 10 years of his PROSOCO career managing its industry-leading Customer Care Department, and the last six years directing national activities for PROSOCO's Concrete Flooring Group.

The new structure will allow future marketing efforts to focus first on the corporate brand, and secondarily on individual products or product lines.

Nicole Lauderdale has been promoted to Brand Strategy Group Director, a role in which she will manage research strategy and oversee all branding projects. This new role better utilizes Lauderdale's skills she acquired prior to joining PROSOCO in 2015.

John Young has been promoted to Creative Director, a role in which he will define and guide all creative strategy and design projects. This role frees Young to apply his visual and story-telling skills to the benefit of the PROSOCO brand and all PROSOCO businesses.

Darcy Boyle has been promoted to Media and Communications Director, a role in which she will manage all messaging strategies, media relations, email marketing and communications. In traditional print and rapidly evolving digital media, the importance of consistent, harmonized messaging strategies has never been greater.

Javier Aqui is PROSOCO's newly hired Events Coordinator. In this new position, Aqui coordinates PROSOCO's trade show, networking and travel logistics.

New hire, **Andrzej Rokicki, PhD**, will serve PROSOCO as its Director of Technology and Innovation. Previously the Industry Liaison Director for the University of Kansas's Center for Environmentally Beneficial Catalysis, Rokicki will manage entire product line life cycles from strategic planning to tactical activities; investigate new product technologies that align with PROSOCO's goals and objectives; and identify market and regulatory trends that impact the industries PROSOCO serves. Rokicki brings a wealth of chemistry knowledge and experience to the newly created position. With a PhD in chemistry from Warsaw (Poland) University of Technology and experience in several international research posts, Rokicki holds 33 patents; has authored more than 25 papers; is well-versed in inorganic, organic and organometallic chemistry; and is an expert in catalysis.

INTERESTED IN SEEING YOUR PEOPLE IN THIS COLUMN?

Email your People on the Move announcements to editor@icri.org. Editorial content for the September/October issue is due by July 3, 2017 and content for the November/December issue is due by September 1, 2017.

CHAPTER MEETINGS & EVENTS

ARIZONA
September 27, 2017
CHAPTER DINNER MEETING
Topic: Floor Testing & Inspection
Speaker: Lee Eliseian
Phoenix Airport Hilton
Phoenix, AZ

BRITISH COLUMBIA
June 24, 2017
CHAPTER SUMMER SOCIAL
Vancouver Canadians Baseball
Scotiabank Field at Nat Bailey Stadium
Vancouver, BC

CAROLINAS
July 20-21, 2017
CHAPTER SUMMER MEETING
Topic: Repairs in Adverse Conditions and Harsh Environments
Crowne Plaza Asheville
Asheville, NC

CENTRAL FLORIDA
September 13, 2017
CHAPTER MEETING
Topic: Surface Preparation
Red Lobster
Sanford, FL

DELAWARE VALLEY
September 28, 2017
CHAPTER GOLF OUTING
Rock Manor Golf Course
Wilmington, DE

FLORIDA WEST COAST
August 2, 2017
CHAPTER DINNER MEETING
Holiday Inn Clearwater
Clearwater, FL

August 25, 2017
CHAPTER GOLF OUTING
TPC Tampa Bay
Lutz, FL

September 19, 2017
CHAPTER OUTING
Baseball Game, Rays vs. Cubs
Tropicana Field
St. Petersburg, FL

GEORGIA
August 24, 2017
CHAPTER LUNCHEON MEETING
Maggiano's Perimeter
Atlanta, GA

September 28, 2017
CHAPTER LUNCHEON MEETING
Maggiano's Perimeter
Atlanta, GA

GREAT PLAINS
August 10, 2017
CHAPTER SEMINAR
Masonry Restoration Seminar
Goedecke St. Louis
St. Louis, MO

August 10, 2017
CHAPTER OUTING
Night at AT&T Ballpark Village
St. Louis, MO

September 14, 2017
CHAPTER GOLF OUTING
Tiffany Greens Golf Club
Kansas City, MO

METRO NEW YORK
July 20, 2017
CHAPTER BOAT CRUISE
Dinner and Cruise Around Manhattan
Chelsea Piers
New York, NY

MINNESOTA
July 18, 2017
CHAPTER GOLF OUTING
Edinburgh USA
Brooklyn Park, MN

NORTH TEXAS
September 14, 2017
CHAPTER MEMBERSHIP MEETING
Mattito's Tex-Mex in Oak Lawn
Dallas, TX

ROCKY MOUNTAIN
August 14, 2017
CHAPTER GOLF TOURNAMENT
Hiwan Golf Club
Evergreen, CO

SOUTHERN CALIFORNIA
September 20, 2017
CHAPTER TECHNICAL SEMINAR
Topic: Moisture and Concrete Slabs
Speaker: Bud Earley, Aquafin
Phoenix Club
Anaheim, CA

SOUTHWEST FLORIDA
August 15, 2017
GENERAL MEMBERSHIP MEETING
Crowne Plaza Holiday Inn
Fort Myers, FL

VIRGINIA
July 13, 2017
CHAPTER SOCIAL OUTING
Night at the Ballpark
Richmond Flying Squirrels
Richmond, VA

TORONTO
August 16, 2017
CHAPTER NETWORKING EVENT
Networking and Billiards
Spacco Restaurant and Bar
Toronto, ON

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

CORRECTION

In the May/June 2017 *Concrete Repair Bulletin* the photos of 2016 ICRI Personal Award winners, Jacques Bertrand and George Reedy, were reversed on page 36. We apologize for this error. Following are the correct photos with names:


Jacques Bertrand


George Reedy

CHAPTER NEWS

KEN LOZEN VISITS NORTH TEXAS

ICRI Technical Director Ken Lozen visited the North Texas Chapter in February to update Chapter members on ICRI's new Surface Repair Technician Certification Program. A large crowd gathered at Mattito's Tex-Mex Restaurant in Dallas to see a demonstration of the different learning modules that make up the fully online, Tier 1 portion of the program. Ken also discussed the steps involved with completing the Tier 2 portion to obtain full certification, and the importance of getting members certified as inspectors to fulfill the need outlined in ACI's 562 "Repair Code." If the Texas Chapters can get commitments from 20 members, ICRI is willing to put on a full certification program for us in Texas. A North Texas Chapter member has volunteered his warehouse for the live, hands-on portion of the program location.

A large crowd gathered for Ken Lozen when he presented the learning modules contained in Tier 1 for the Surface Repair Technician Program

NTX Chapter President, Julie Bolding, PE (left), presents Ken Lozen with a commemorative Chapter pen

NORTH TEXAS MOURNS THE LOSS OF A FOUNDING MEMBER

The North Texas Chapter was saddened to learn of the passing of long-time member Jesse Points on Tuesday, June 6, 2017. Jesse was one of the founding members of the NTX Chapter that was chartered in November 2000. Jesse was a very active member of the Chapter, serving for many years as the Chapter's Chair of the Special Events Committee. Never one to seek the spotlight, Jesse was most comfortable working behind the scenes and at the registration table at every meeting, golf tournament, casino night, sporting clay, Mega Demo and Texas State Conference event. Tireless in his efforts, he served as Chairman for the annual NTX Chapter Golf Tournament for all 15 years it has been held. Jesse also served on the Chapter's Legal and Finance Committee and on the Nominating Committee. Most recently, Jesse was employed as an outside sales representative for long-time NTX Chapter sponsor and supporter, All-Tex Supply Company in Dallas. The entire NTX family mourns the loss of this kind, generous, hard-working, and stalwart member of the Chapter.

Jesse Points (right) with Bob Scheelar at NTX's 2016 Golf Classic

Jesse Points (center) working the registration table at the NTX Chapter's February, 2017 meeting

METRO NEW YORK HOSTS TECHNICAL PRESENTATION ON THE COIGNET BUILDING

On Wednesday, May 17, 2017 the Metro New York Chapter of ICRI hosted a meeting with friends, colleagues, and industry associates at Club 101 on Park Avenue in mid-town Manhattan. The technical speaker for the evening was Mary Jablonski, Conservator and President of Jablonski Building Conservation, Inc. Her work varies from conservation of architectural elements and sculpture to field surveys, condi-

tion assessments, field testing, laboratory analysis and forensic research. This work includes a significant number of masonry and concrete buildings.

In 1873 the New York and Long Island Coignet Stone Company built offices along the Gowanus Canal in Brooklyn, New York, to serve as an advertisement for the company's cast stone products. Rusticated, smooth, beveled, and ornamented surfaces decorated the cast stone blocks displaying the possibilities of the new cast stone material. One hundred and forty years later, the Coignet Building remained barely standing and the original company was long gone. It may be the earliest cast stone building in the country. Also important was that it represented industrialization of building products and the growing importance of concrete. When work began on the restoration of the Coignet Building in 2014, little was known about the cast stone and its composition. The first step was to understand the materials and how they were deteriorating in order to know how to best repair. As part of the materials study, petrographic and chemical examinations were performed on cast stone samples. The findings were illuminating and useful.

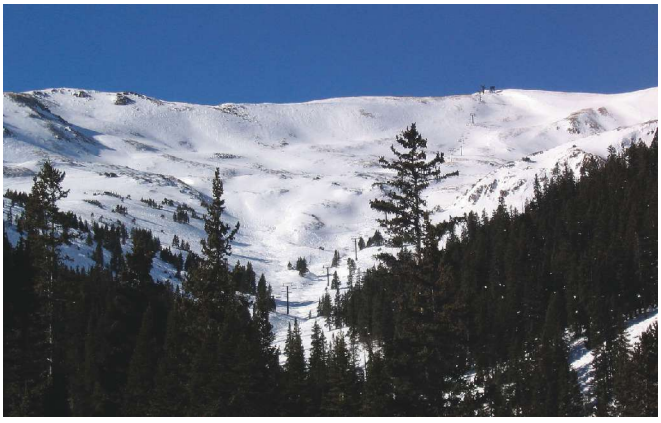
Technical Speaker Mary Jablonski at the presentation

The completed restoration of the Coignet Building

ROCKY MOUNTAIN HOSTS SKI TRIP

The Rocky Mountain Chapter held its second annual Ski Outing on March 3, 2017. It was a beautiful day at Loveland Ski Area for the sold out ski event! The ski outing was coordinated by Mike Devlin with Rocket Supplies. Special thanks to Calvin Chambers with Summit Sealants and Angela Echols with ProCoat Systems for filling in at the last minute for a sick event coordinator. Now that's teamwork! Once again, Calvin was a great grill master!

With this view, you can see why the Chapter chose Loveland Ski Area for its event



Another view, and if you look closely, you can see the chair lift going up the mountain

GEORGIA HOSTS SPRING SCHOLARSHIP FUND GOLF TOURNAMENT

In 1959, a tradition began with the development of Northwood Country Club, the first private club in Gwinnett County. Today the tradition continues, providing memorable experiences for ICRI Members and their invited guests. The 18-hole golf course was designed by Willard Byrd and plays a staggering 6,800 yards from the gold tees. Northwood Country Club played host to the 2016 ICRI-Georgia Fundraising Golf Tournament on May 22, 2017. This year's ICRI Georgia Fundraising Golf Tournament has been our best year ever with participation at an all-time high, 80 participants! Special thanks goes out to the event sponsor Coastal Construction Products and the 80 golfers that played in this year's tournament with company sponsorship for holes, tents, food, and goodie bags supported by several volunteers. Upon conclusion of the golf, Georgia Chapter President Joshua Lloyd presented trophies to the 1st, 2nd, and 3rd place winners and distributed raffle prizes. Prizes included golf clubs, Amazon Dots, Kindle

Fires, apparel, and gift cards which were generously donated by PGA Superstore and local participating companies. Congratulations to all of our winners!

Ready to tee off! The coveted trophies (inset)

The first place group included Mickey Aycox and Brad Ramey

The second place group included Rafael Bryan, Steve Mason, Darrin Ross, and Justin Billman

The third place team included Tony Gilleland, William Cox, Ron Sattele, and Craig McCurdy

HOUSTON REFRESHES INTEREST IN ICRI

On April 20, 2017, the Houston Chapter invited Mark LeMay to come and give a spiel on what ICRI has to offer. While he touched on things that the board can do for its members, more importantly, he surprised some people with the breadth of resources available to them as members

The meeting was at "El Bigbad" in downtown Houston and people were attentive and interested. In the end, the chapter noted that several people came up and asked how to become a member

The Chapter was grateful to have Mark, the current ICRI Secretary, present at their meeting and remind everyone of the benefits of belonging to ICRI. But they are pretty sure he was able to slip one "Dad joke" in during the presentation

2017 CHAPTER NEWS DEADLINES

SEPTEMBER/OCTOBER
July 10, 2017

NOVEMBER/DECEMBER
September 10, 2017

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

NTX Sporting Clay winners from All-Tex Supply

NORTH TEXAS HOSTS SPORTING CLAY CLASSIC

The North Texas Chapter held its Third Annual Sporting Clay Classic at the Dallas Gun Club in Lewisville, TX on April 14, 2017. A total of 13 teams competed for cash prizes. Congrats to the top marksmen, Team All-Tex Supply, on their first-place team finish!

NORTH TEXAS PRESENTS TO UTA STUDENTS

On April 5, 2017, members of the North Texas Chapter traveled the University of Texas at Arlington (UTA) campus to hold a joint meeting with the UTA student chapter of the American Society of Civil Engineers. The event featured a presentation by Mark LeMay, AIA, current ICRI Secretary and Principal at JQ in Fort Worth, Texas. Mark's presentation provided students with an overview of concrete repair basics and focused on problems requiring concrete repair that tend to arise during new construction. The NTX Chapter also presented the UTA Department of Civil Engineering with a check for the North Texas Chapter's donation of $2,000 to the Department's scholarship fund.

Mark LeMay presents to the UTA student chapter of AIA

The check presentation to UTA from the North Texas Chapter

UMD CONCRETE CANOE CREW COMMANDEERS BALTIMORE-WASHINGTON CHAPTER MEETING

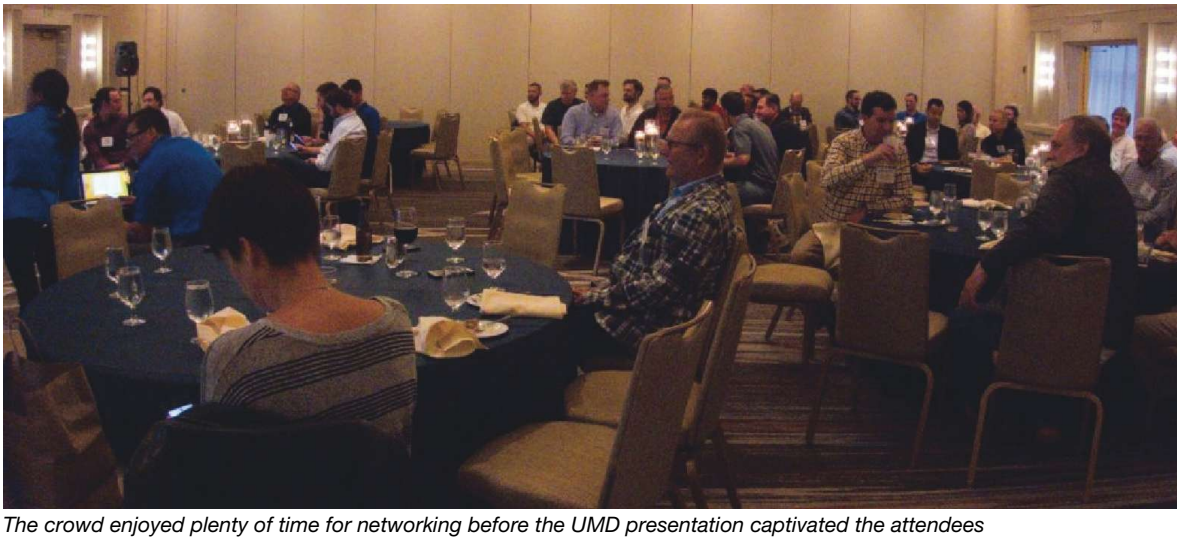
The ICRI Baltimore-Washington Chapter was treated to a presentation by Wing-Mei Ko and Vasilios Plangetis of the University of Maryland's Concrete Canoe Team on their award-winning boat. Their 2016 entry received a perfect score and finished every race in the Mid-Atlantic Region competition and was invited to compete at the National Concrete Canoe Competition in Texas.

Ko and Plangetis shared some insight to the process of building their concrete canoe. The project took almost 1,700 hours to complete, was required to meet the ASTM C-330 standard for lightweight aggregates for 25% of the mix design, and was designed to incorporate recycled materials to improve its sustainability. Aggregate included glass, expanded slate, pumice, and lightweight polymeric spheres, allowing the concrete's unit weight to be near 70 pcf with a compressive strength around 1,000 psi. Reinforcement including basalt fiber mesh; monofibrillated fiber lent tensile strength to the frame. The team even added an artistic flair, using formwork to separately pour aesthetic mix into inlays and create their 1920s Speakeasy-themed canoe, dubbed Whiskey River.

The UMD duo held a rousing question-and-answer session with ICRI-BWC members following their presentation. They are looking forward to advancing as the next generation of concrete repair professionals, having started a new student chapter of ACI. The Gaithersburg Marriott Washingtonian Center proved again to be a fine setting for dinner and conversations between both new and lasting acquaintances. The ICRI-BWC looks forward to the numerous events to be held in the remainder of the year.

Baltimore-Washington's current President, Shannon Bentz, P.E. (left) presents an award to the chapter's immediate past president, Adam Hibshman (right)

Wing-Mei Ko (left) and Vasilios Plangetis (center) of the University of Maryland's Concrete Canoe Team with Shannon Bentz, P.E. (right)



The crowd enjoyed plenty of time for networking before the UMD presentation captivated the attendees

VIRGINIA HOSTS SPRING SYMPOSIUM

Thanks to everyone who attended the Virginia Chapter Spring Symposium in Williamsburg at the Colonial Heritage Club. The attendees were treated to outstanding presentations on *Infrastructure: Bridges & Highways* and then enjoyed the perfect weather for a round of golf.

Golf tournament winners were (from left to right) Fuller Ramsey, Robert Dewolff, Mike Mathews, and Ed Kuuckowski

Longest Drive honors went to Jeff Gray (left) with Eastern Waterproofing of Virginia and the winner for Closest to Pin was Charlie Bryant (right) with Manganaro Mid-Atlantic

The Virginia Spring Symposium included a presentation from Douglas Bond with McMullen and Associates on Aqueducts

The spring event attracted a great crowd

The symposium also included opportunities to visit with local vendors

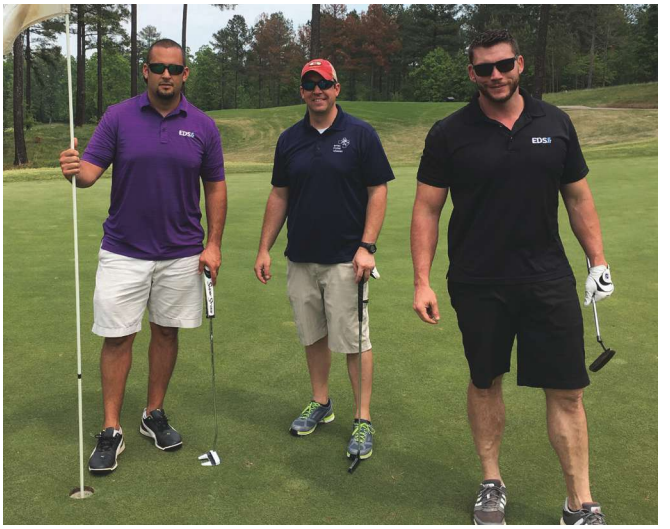
There were plenty of opportunities for networking and catching up with friends

CAROLINAS HOST SPRING MEETING

The Carolinas Chapter hosted its 2017 Spring Meeting in Durham, NC, on April 27 and 28. The meeting started off on Thursday morning with a Joint Golf Tournament between members from the chapter and from the Waterproofing Contractors Association. The weather was perfect for golf and over 50 golfers enjoyed the challenge of playing the Golf Club at Chapel Ridge in Pittsboro, NC. After golf, members made their way to Durham for the chapter's baseball outing on the Party Patio at the Durham Bulls Athletic Park. Over 60 members, spouses and family came out to see the Bulls take on the Syracuse Chiefs in great minor league baseball action.

The technical sessions on Friday at the Durham Convention Center featured four speakers on the topic of *Safety, Silica and Access*. The presenters included Mike O'Grady, Executive Vice President of Safety with Terracon; Tom Wilder, Safety Education Specialist with the North Carolina Department of Labor; Ross Peters, Safety Manager with Blythe Construction; and Keith Kirkland, Safety Manager with Associated Scaffolding, Inc. Subjects discussed ranged from *Fall Protection for Swing Stage* to *Respirable Crystalline Silica*. Attendees engaged in robust question and answer sessions on the culture of safety and were treated to a traditional Carolina BBQ lunch. The chapter looks to continue a successful 2017 with their Summer Meeting in Asheville, NC, July 20-21, where the topic will be *Repairs in Adverse Conditions and Harsh Environments*.

Attendees at the Carolinas Spring Meeting prepare for the golf outing



Guests of the Carolinas out on the course

The technical sessions were a big draw with a focus on safety

CHAPTER NEWS

CHAPTERS COMMITTEE CHAIR'S LETTER

JOHN McDOUGALL
Chapters Chair

Welcome to the dog days of summer. The economy is rolling along at full steam and opportunities are knocking down doors all over the country. At these times as Chapter leaders, we need to consider how we are serving our membership, the chapter members who are the lifeblood of this organization. The Carolinas Chapter, for example, is hosting a social evening at the new Belgium Brewery in Asheville followed by a full day of technical seminars, and the team in Columbus is busy working on the final steps of their chapter-hood and the necessary regulatory documents.

During these economic boom years, the influx of new labor in the market rises and this new labor base needs training—both concrete repair skills and safety. ICRI Chapters have the opportunity to be the regional providers of state-of-the-industry training and certifications. Demo days, Mega Demos, and Boot Camps have all shown their worth by providing high quality technical hands-on training to the field service crews of our member companies. Many chapters have record-breaking attendance at such events, and with diligent planning and execution; something like it can be your next big event.

Summer is also when the Regional Representatives to the ICRI Board of Directors are considered for nomination. The Chapters in Regions 1, 4 and 7 all have the opportunity to get together to present a candidate for the ICRI Board of Directors. Also up for nomination are two At-Large Board positions, open to anyone with a desire to serve. Each region's chapter leaders should nominate an interested, qualified member to represent their region on the Board of Directors. Region 1 is comprised of the five Chapters in Florida; Region 4 is Metro New York, Connecticut, New England, and Quebec Province; Region 7 includes the three Texas Chapters and the Rocky Mountain Chapter.

These Regional Reps are a great resource for Chapter leaders. They can questions with chapter issues, annual reports, or updates on new actions at ICRI—I encourage you to use these resources. All contact info is updated at icri.org in the Board of Directors tab. As always, feel free to reach out to either Dale Regnier or me if you have questions about the positions or the nomination process.

Looking forward to seeing a full house in New Orleans in November for the ICRI 2017 Fall Convention. Our goal is to have each chapter represented by a delegate at the Convention, at the Chapters Committee and the Inter-Chapter Luncheon. Please be sure to reach out to Dale when registering your Chapter Delegate; he will send delegate-specific registration info to each chapter for review. There is an explicit process for delegate registration, so when you make those plans, be sure to reach out to the ICRI staff first.

See you on Bourbon Street!

John McDougall
ICRI Chapters Committee Chair

NEW PRODUCTS

PROTECT POOL DECKS, WATERFALLS, NATURAL STONES AND MORE WITH DECK-O-SHIELD

DECK-O-SEAL, a division of W. R. MEADOWS, offers DECK-O-SHIELD and DECK-O-SHIELD PLUS as a complete line of pool deck products to protect even the most porous outdoor surfaces.

DECK-O-SHIELD is a ready-to-use, water-based sealer and water repellent for natural stone, concrete, and masonry surfaces. VOC compliant DECK-O-SHIELD is specially designed for use on surfaces around pool decks and waterfalls. Apply ready-to-use DECK-O-SHIELD easily by brushing or spraying. Surfaces appear virtually unchanged after application and drying while protecting against rust staining, spills, and damage caused by salt in water.

Premium-grade DECK-O-SHIELD PLUS protects porous surfaces such as tile, concrete, pavers, mortar joints, stucco and grout around pools. DECK-O-SHIELD PLUS provides increased resistance to spalling and pitting of porous stone and concrete surfaces caused by salt penetration and freeze-thaw cycles. DECK-O-SHIELD PLUS is ideal for weatherproofing and protecting virtually all porous surfaces without altering the original color or tint. DECK-O-SHIELD PLUS is also water-based and VOC compliant.

"DECK-O-SHIELD is easy to use and protects all of the various materials used in and around swimming pools without changing the natural appearance," said Jim Dill, Division Manager of DECK-O-SEAL.

Free product samples of DECK-O-SHIELD in both bottle and tile form as well as DECK-O-SHIELD PLUS are available by request at https://www.deckoseal.com/literature-request.

BOSCH GCB10-5 DEEP CUT BAND SAW MAKES CLEAN, LOW-SPARK 4¾" CUTS IN METALS AND TOUGH MATERIALS

The Bosch GCB10-5 has a 10-amp motor, which delivers precise cuts in everything from rebar to copper pipe, from steel track to threaded rod. The band saw saves time by making clean cuts that require almost no rework for burrs or tempering colors. It accommodates most common applications in a single pass thanks to a cutting depth of up to 4¾ in.

The tool is ergonomically designed and weighs only 14.5 lbs., allowing it to provide efficient performance in a compact package. The band saw also includes a saw hook for during-the-job storage and an LED light to illuminate the cut line for greater accuracy.

The Deep Cut band saw provides nearly spark-free cuts for safer metal-cutting operation. It features variable-speed settings, so the user can match the cut rate to the material for greater precision. Settings start at 100 surface feet per minute and go up to 380 surface feet per minute.

With a compact design and weight of less than 15 pounds, this band saw is ideal for cutting tough metal in difficult areas or for extended overhead applications. The main handle provides a comfortable grip for cutting in various positions. It also has a carry handle for easy transport.

To learn more about the Bosch GCB10-5 Deep Cut Band Saw or to find a local dealer, visit www.boschtools.com or call 877-BOSCH-99.

NEW ARISFOR™ HIGH PERFORMANCE MULTI-SURFACE WATERPROOFER IS POWERED BY NANOTECHNOLOGY

Arisfor, LLC, a leading provider of coatings and sealers for a wide range of masonry and concrete surfaces, recently introduced its next-generation Multi-Surface Waterproofer (MSW). Using leading edge nanotechnology, the new Arisfor™ MSW forms a moisture barrier that integrates with the surface material, providing superior protection against the damaging effects of water intrusion, acids and deicing salts.

The new Arisfor MSW is the result of an association with Integricote™, the first nanotechnology spin-off company from the University of Houston, and currently based at Energy Research Park in the center of Houston, TX. The relationship was initiated when Arisfor Director of Sales and Marketing Martin Doody and Plant Manager Chris Lovett were introduced to Shay Curran, a professor of physics at the University of Houston, and CEO of Integricote.

By the time Doody and Lovett met up with Curran, Integricote had already received accolades for its unique coating formulations, originally designed to keep solar panel surface areas clean. Previously, Integricote had won two competitions for its innovative product. Curran and his team realized the potential for broader commercial application of their formula-

NEW PRODUCTS

tions as a superior waterproofing agent for a variety of surface types.

Working with Arisfor to develop the new MSW, the Integricote team deliberately moved away from traditional sealing agents. Curran explained, "Most sealing and coating formulations are polymer-based; they interact with the surface area they are designed to treat in a similar manner as paint, and will degrade under ultraviolet light over time." Integricote developed a nanotechnology-based formulation that would bind to concrete and masonry from the inside out upon application. This enables the penetrating sealer to become an integrated, highly functional part of the concrete and masonry itself.

Arisfor MSW is designed to prevent corrosion, spalling and cracks caused by moisture, de-icing salts and chemicals, for new or untreated concrete construction, masonry and precast applications. The product is equally suited to both residential and commercial use, including home and commercial building facades, parking lots and decks, driveways and curbs, loading docks and ramps, and concrete sidewalks and stairs. Other applications include tile, limestone, granite, marble, slate, and even gravestones. Arisfor MSW is currently marketed in one and five gallon pails, and is applied with a standard sprayer.

PROSOCO INTRODUCES AN IMPROVED REPELLENT FOR CONCRETE FLOORS

A new solvent-based alternative to PROSOCO's popular Concrete Protector offers more powerful and robust initial water-beading and repellency on all kinds of finished concrete floors. Formulated based on contractors' feedback, the new Concrete Protector SB offers improved performance in repelling water, oil and stains over competitive products, and it can be burnished.

Surfaces treated with Concrete Protector SB retain their natural appearance, texture and breathability, and are easier to maintain. The product is ideal for areas of high traffic or wheeled traffic where surface film-forming sealers may prematurely wear off.

The low-odor, VOC-compliant product is easily applied with pump-up sprayers and can also be applied to surfaces previously treated with Consolideck guards like LSGuard and PolishGuard.

The product previously known as Concrete Protector remains available as Concrete Protector WB for customers who desire a water-based formulation.

For more information, visit http://www.prosoco.com/products/consolideck-concrete-protector-sb

BOSCH DAREDEVIL® MULTIPURPOSE DRILL BITS FEATURE MULTI-GRIND CARBIDE HEAD AND HEX SHANK FOR MAXIMUM MATERIAL VERSATILITY

Bosch Daredevil® multipurpose bits get the job done in a variety of materials, including masonry, brick, block, tile, metal, wood and plastic. Thanks to a carbide multi-grind head (tip is ground on four surfaces) that delivers up to 85 percent faster drilling in metal versus competitive multi-material bits, these bits are ready for any drilling task in almost any material. They could be the only bits you'll ever need.

The multi-grind head on Bosch Daredevil multipurpose bits feature sharp edges that are tough enough for metal and masonry applications. The bits' robust tungsten carbide head ensures no skating, clean holes and

long life in impact applications. Daredevil multipurpose bits have up to 9x life versus competitive bits in multi-material applications.

Daredevil multipurpose bits have an impact-rated hex shank that can withstand tough drilling when used in a hammer drill or an impact driver. The bits feature steep flutes with ribs for fast dust removal in applications that range from masonry to metal. Diameters extend from ⅛" to ½".

To learn more about the Bosch Daredevil multipurpose bits or to find a local dealer, visit www.boschtools.com or call 877-BOSCH-99.

BOSCH GDE18V-16 CORDLESS HEPA DUST COLLECTOR OFFERS OSHA-COMPLIANT SOLUTION FOR SDS-PLUS® DRILLING APPLICATIONS

For the concrete professional who needs to drill using a rotary hammer often, but can't be tethered to a dust extraction vacuum—Bosch has a solution for you. The GDE18V-16 Professional dust collector for the Bosch GBH18V-26 rotary hammer enables tradesmen to work in a dust-free, OSHA-compliant environment regardless of the location.

The GDE18V-16 Professional can simply be attached to the rotary hammer when required. It has its own motor that's supplied with power by the rotary hammer battery. The dust extraction module has an automatic power on/off. It automatically starts at the same time as the rotary hammer and continues to function for two seconds after the drilling operation is ended to ensure optimal dust extraction.

The integrated HEPA filter provides reliable dust protection and is extremely easy to empty and clean.

The compatible GBH18V-26 1" 18-volt SDS-plus rotary hammer is the cordless workhorse of any construction site, providing the power and torque to drill and chisel in materials that range from concrete to steel. It delivers 1.9 ft.-lbs. of torque in a tool that weighs only 7.7 lbs. The ergonomic L-shape design offers great horizontal power transmission. This is a power tool that will drill longer and hit harder than bigger tools with more weight.

To learn more about the Bosch GDE18V-16 Professional integrated dust module or to find a local dealer, visit www.boschtools.com or call 877-BOSCH-99.

INTERESTED IN SEEING YOUR NEW PRODUCTS IN THIS COLUMN?

Email your new product information to editor@icri.org. Editorial content for the Nov/Dec issue is due by September 1, 2017 and content for the Jan/Feb issue is due by November 1, 2017.

NEW MEMBERS

COMPANY MEMBERS

American Construction & Engineering Co.
420 Lincoln Road, Ste 402
Miami Beach, Florida 33139
United States
Peter Anta
Email: pcanta@aol.com

Anaya Contracting
6753 Garden Road, Ste 105
Riviera Beach, Florida 33404
United States
Richard Anaya
Email: richard@anayacontracting.com

Aquajet Systems AB
Brunnsvagen 15
Holsbybrunn, Holsbybrunn 57015
Sweden
Patrik Andersson
Email: patrik.andersson@aquajet.se

Beck Pizor Engineering
1628 Dale Mabry Hwy, Ste 106
Lutz, Florida 33548
United States
Patrick Beck
Email: PatB@BeckPizorEngineering.com

CEPOXY
240 Main St
Grandview, Missouri 64030
United States
Bobby Combs
Email: robert_combs@ais-kc.com

Gulf Coast Concrete Solutions, Inc.
5342 Barbarossa Ave
Sarasota, Florida 34235
United States
Mellissa Gross
Email: GCCSFlorida@gmail.com

Hansa Restoration, Inc.
8 York Street, 3005
Toronto, Ontario L1W 2A1
Canada
Lukasz Skrzeczkowski
Email: lukasz@hansarestoration.ca

Hubert Contracting LLC
44960 Vic Wertz Dr.
Clinton Twp, Michigan 48036
United States
Norbert Hubert
Email: nhubert@hubertcontracting.com

MCW Restoration Services, LLC
1100 SW 30th Avenue
Pompano Beach, Florida 33069
United States
Cindy Raffio
Email: craffio@mcwcompanies.com

MTN, Inc.
8599 Prairie Trail Dr, Ste 600
Englewood, Colorado 80112
United States
Jason Giantonio
Email: jason.giantonio@mtn-inc.com

Vic's Painting & Reconstruction
17000 Alico Commerce Court, Ste 102
Fort Myers, Florida 33967
United States
Rich Baldi
Email: Rich@vicspainting.com

WB Construction Products
1223 Budd St
Cincinnati, Ohio 45203
United States
Vince Lambert
Email: vlambert@wbcproducts.com

ADDITIONAL INDIVIDUALS FROM MEMBER COMPANIES

MiAlicia Amaya
Restocon Corporation
5750 N Sam Houston Parkway E, Ste 602
Houston, Texas 77032
United States
Email: mamaya@restocon.com

Jacqueline Bascetta
Pullman SST, Inc.
134 West 29th St., 3rd Floor
New York, New York 10001
United States
Email: jbascetta@pullman-services.com

Jared Brewe
Simpson Gumpertz & Heger, Inc.
135 S. Lasalle St., Ste 3800
Chicago, Illinois 60603
United States
Email: JEBrewe@sgh.com

Zach Carroll
Pullman SST, Inc.
280 W. Jefferson Ave.
Trenton, Michigan 48183
United States
Email: zcarroll@pullman-services.com

Sam Gobin
Restocon Corporation
5750 N Sam Houston Parkway E, Ste 602
Houston, Texas 77032
United States
Email: sgobin@restocon.com

Roel Gregorio
Pullman SST, Inc.
134 West 29th St., 3rd Floor
New York, New York 10001
United States
Email: rgregorio@pullman-services.com

Joshua Jaskowiak
Wiss Janney Elstner Associates, Inc.
2751 Prosperity Avenue, Ste 450
Fairfax, Virginia 22031
United States
Email: jjaskowiak@wje.com

Reid Johnson
WSP Canada Inc.
600 Cochrane Dr. Suite 500
Markham, Ontario L3R 5K3
Canada
Email: reid.johnson@wsp.com

Adam Levesque
Walker Parking Consultants
20 Park Plaza, Ste 1202
Boston, Massachusetts 02116
United States
Email: adam.levesque@walkerrestoration.com

James Mendygral
Simpson Gumpertz & Heger, Inc.
100 Pine St.
San Francisco, California 94111
United States
Email: jemendygral@sgh.com

Nathan Moloney
Nova Engineering and Environmental
75 Maddox Rd., Ste 102
Buford, Georgia 30518
United States
Email: nmoloney@novausa.com

Eric Olsen
Simpson Strong-Tie
215 143rd Street SE
Everett, Washington 98208
United States
Email: eolsen@strongtie.com

NEW MEMBERS

Ashish Patel
Restocon Corporation
5750 N Sam Houston Parkway E, Ste 602
Houston, Texas 77032
United States
Email: apatel@restocon.com

Robert Penn
Simpson of Maryland
7476 Candlewood Rd.
Hanover, Maryland 21076
United States
Email: rpenn@simpsonofmd.com

Bryce Perkins
Structural Group
3509 Cottonwood Springs Dr.
The Colony, Texas 75056
United States
Email: bperkins@structural.net

Byron Preston
Cascade Aqua-Tech Ltd.
3215 Norland Avenue
Burnaby, British Columbia V5B 3A9
Canada
Email: bpreston@cascadeaqua.com

Laura Schulz
McGill Restoration, Inc.
2821 Grebe St
Omaha, Nebraska 68112
United States
Email: LSchulz@mcgillrestoration.com

Mark Willis
Simpson of Maryland
7476 Candlewood Rd.
Hanover, Maryland 21076
United States
Email: mwillis@simpsonofmd.com

SUPPORTING MEMBER

UFLOOR Systems Inc.
14509 E. 33rd Place
Aurora, Colorado 80011
United States
Kirk Francis
Email: kirk.francis@ufloorsystems.com

ADDITIONAL INDIVIDUALS FROM SUPPORTING MEMBER COMPANIES

Michael Broadie
Sika Corporation
46 Oakwood Blvd
Poughkeepsie, New York 12603
United States
Email: broadie.michael@us.sika.com

David Johnston
Walker Restoration Consultants
20 Park Plaza, Ste 1202
Boston, Massachusetts 02116
United States
Email: david.johnston@walkerrestoration.com

Eddie Rabionet
BASF Building Systems
10 SW S. River Dr. #1609
Miami, Florida 33130
United States
Email: eddie.rabionet@basf.com

NEW MEMBERS

Matthew Swirbalus
Contracting Specialists
453 South Main St
North Attleboro, Massachusetts 02703
United States
Email: mswirbalus@contractingspecialists.com

Ricardo Villanueva
Allied Building Products
2445 NW 76th St
Miami, Florida 33147
United States
Email: Ricky.villanueva@alliedbuilding.com

INDIVIDUAL MEMBERS

Salami Aina
Salami Concrete Industries
10 Salami Aina Close, Off Airport Road
Akure, West Africa 00234
Nigeria
Email: liberty4info@gmail.com

Paola Arroyave
M2e Consulting Engineers
1655 Palm Beach Lakes Blvd. #C-505
West Palm Beach, Florida 33401
United States
Email: parroyave@m2e.com

Jose Benitez
H.E.A.
153 S. Muscatel Ave
San Gabriel, California 91776
United States
Email: jose.b@pacific-floors.com

Aniket Borwankar
Simpson Strong-Tie Company
219 Sunshine Dr
Pacifica, California 94044
United States
Email: aborwankar@strongtie.com

Wesley Bullock
Terracon Consultants, Inc.
110 12th Street North
Birmingham, Alabama 35203
United States
Email: bullockwo@gmail.com

Jessica Clifford
Joseph B. Callaghan, Inc.
1617 John F. Kennedy Blvd, Ste 1655
Philadelphia, Pennsylvania 19103
United States
Email: jclifford@jbciengineers.com

Paul Deram
Lafarge Canada, Inc.
334 Av. Avro
Pointe-Claire, Quebec H9R 5W5
Canada
Email: paul.deram@lafargeholcim.com

Matt Dougherty
Walker Parking Consultants/Engineers, Inc.
4904 Eisenhower Blvd, Ste 150
Tampa, Florida 33634
United States
Email: matthew.dougherty@walkerrestoration.com

Nick Downar
CCD Technologies Limited
195 Athabascan Avenue
Sherwood Park, Alberta T8A 4C8
Canada
Email: nick@ccdtech.com

Matthew Duckstein
M2e Consulting Engineers
1655 Palm Beach Lakes Blvd. #C-505
West Palm Beach, Florida 33413
United States
Email: mduckstein@m2e.com

Wesley Evans
United Corrosion Control LLC
4717 Washington Blvd
Halethorpe, Maryland 21227
United States
Email: aevans@united-corrosion.com

Derek Fankell
Custom Concrete Prep & Polish
5511 W 56th Ave, Unit #122
Arvada, Colorado 80002
United States
Email: derek@concreteprepandpolish.com

Bangee Goh
Maiyer Craft (M) Sdn Bhd
31, Jalan Utarid U5/29
Mahsing Integrated Industrial Park
Shah Alam, Selangor 40150
Malaysia
Email: haussen.mc@gmail.com

Yaima Granadillo
M2e Consulting Engineers
1655 Palm Beach Lakes Blvd. #C-505
West Palm Beach, Florida 33401
United States
Email: ygranadillo@m2e.com

Derek Greska
WR Meadows
9 Pierce St
Hudson, Massachusetts 01749
United States
Email: Dgreska@wrmeadows.com

L. Craig Hardin
McGoodwin, Williams & Yates, Inc.
302 E Millsap
Fayetteville, Arkansas 72703
United States
Email: chardin@mwyusa.com

Scott Harvey Lewis
M2e Consulting Engineers
1655 Palm Beach Lakes Blvd. #C-505
West Palm Beach, Florida 33413
United States
Email: shlewis@m2e.com

Nicholas Hee
Kryton International, Inc.
5150 Hidalgo St
Houston, Texas 77056
United States
Email: nhee@kryton.com

Joel Hintikka
CCD Technologies Limited
195 Athabascan Avenue
Sherwood Park, Alberta T8A 4C8
Canada
Email: joelh@ccdtech.com

Anthony Howes
PCS Concrete Technologies
892 Scott Street
Columbus, Ohio 43222
United States
Email: ahowes@palmettobuilds.com

Frank Hughes
ChemMasters
232 Valley Park Dr
Pittsburgh, Pennsylvania 15216
United States
Email: frank.hughes@chemmasters.net

Andrew Iokia
Premier Flooring Company, L.L.C.
PO Box 3473
Kailua Kona, Hawaii 96745
United States
Email: andrew@premierflooring.co

Brett Kilgore
Tremco Commercial Sealants & Waterproofing
2616 Beaver Bend Drive
Plano, Texas 75025
United States
Email: bkilgore@tremcoinc.com

William Kong
Larsen & Landis
11 W Thompson Street
Philadelphia, Pennsylvania 19125
United States
Email: wkong@larsenlandis.com

Timothy Koutnik
Western Specialty Contractors
1535 E. 6th St
Tulsa, Oklahoma 74120
United States
Email: timk@westerngroup.com

Vivek Kumar
Pullman SST Inc.
3145 Almond Street, Apt. 4
Martinez, California 94553
United States
Email: vkumar@structural.net

NEW MEMBERS

Drew Lander
Carmel Area Wastewater District
P.O. Box 221428
Carmel, California 93922
United States
Email: lander@cawd.org

Wesley Lowman
Sherman Industries, LLC
1130 2nd Avenue South
Birmingham, Alabama 35233
United States
Email: Wesley.Lowman@LehighHanson.com

Robert Maley
F.D. Thomas, Inc.
2844 SW Vittorio Street
Port Saint Lucie, Florida 34953
United States
Email: rpmaley@att.net

Mark McDonough
I-80 Concrete
360 NE Coyote Dr
Waukee, Iowa 50263
United States
Email: Mark@i80concrete.com

Murray McKay
Service WaterProofing, Inc.
8822 165th Street
Surrey, British Columbia V4N 1A3
Canada
Email: servicewaterproofinginc@gmail.com

Felipe Naciuk
Sherwin Williams Company
Rua Waldemar Pinheiro Cantergi,
No.80 Apto.202B
Porto Alegre, RS 91130-300
Brazil
Email: naciukinho@gmail.com

Michael Normandale
Sherwin-Williams Company, The
1311 Chippewa St
Jupiter, Florida 33458
United States
Email: michael.j.normandale@sherwin.com

Bryce Perkins
Structural Group
3509 Cottonwood Springs Dr.
The Colony, Texas 75056
United States
Email: bperkins@structural.net

Brian Porter
Tremco Sealants and Waterproofing
1807 Bordeaux Court
Fallston, Maryland 21047
United States
Email: bporter@tremcoinc.com

Carl Ruuska
Dayton Superior Corporation
13202 Briar Forest Drive
Houston, Texas 77077
United States
Email: carlruuska@daytonsuperior.com

Sanjog Sabnis
Terracon Consultants, Inc.
8901 John Carpenter Fwy, Ste 100
Dallas, Texas 75247
United States
Email: Sanjog.Sabnis@terracon.com

Subhajit Saraswati
Jadavpur University
Crooked Lane, Burra Bazar
Hooghly, India 712101
Email: subhajitsaraswati@gmail.com

Christopher Scalero
Imperial Restoration
7061 Stanislaus Place
Rancho Cucamonga, California 91701
United States
Email: cvscalero@gmail.com

Ari Seraphin
Keast & Hood Co.
400 Market St., Ste 1250
Philadelphia, Pennsylvania 19106
United States
Email: aseraphin@keasthood.com

Josh Sesvold
Ventures Equipment, LLC
620 County Road 4841
Haslet, Texas 76052
United States
Email: Josh@ventureseq.com

Tyler Shisler
Lithko Restoration Technologies
1059 Cable Avenue
Columbus, Ohio 43222
United States
Email: shislert@lithkorestoration.com

Nathan Sketch
Lithko Restoration Technologies
1059 Cable Avenue
Columbus, Ohio 43222
United States
Email: sketchn@lithkorestoration.com

Dean Strochein
Knutson Construction Services, Inc.
7515 Wayzata Boulevard
Minneapolis, Minnesota 55426
United States
Email: sriach@knutsonconstruction.com

Tom Tardonia
Atlantic Pacific Insurance
620 SE Central Parkway
Stuart, Florida 34994
United States
Email: ttardonia@apins.com

Charles Waugh
Wilson Engineering
805 Dupont Street, Ste 7
Bellingham, Washington 98225
United States
Email: CWaugh@wilsonengineering.com

Timmy Whitaker
Sherwin Williams Protective & Marine
81 Mayfield Ct
Hiram, Georgia 30141
United States
Email: jay.whitaker@sherwin.com

Dustin Young
SSPC: Society for Protective Coatings
800 Trumbull Dr.
Pittsburgh, Pennsylvania 15205
United States
Email: young@sspc.org

GOVERNMENT

Claude Villiers
Florida Gulf Coast University
10501 FGCU Blvd S.
Fort Myers, Florida 33965
United States
Email: cvillier@fgcu.edu

NEW MEMBERS

STUDENTS/APPRENTICES

Haider Abdulhameed
Rutgers, The State University
33 Marvin LN
Piscataway, New Jersey 08854
United States
Email: hayderadel2004@yahoo.com

Andrew Billingsley
Texas A&M University
206 Bucknell Ct.
College Station, Texas 77840
United States
Email: abillingsley@tamu.edu

Jack Johnson
MCA Construction
3220 Colvin St.
Alexandria, Virginia 22314
United States
Email: jjohnson@mca-construction.com

Jeremy Wheeless
The University of Texas at Austin
3219 Whites Drive
Austin, Texas 78735
United States
Email: jeremywheeless@gmail.com

MARKETPLACE

CLASSIFIEDADS

Masonry Restoration Estimator

Mara Restoration is a Philadelphia-area specialty contractor with a focus on masonry, concrete and building envelope restoration. We are seeking an experienced, self-motivated candidate to estimate opportunities throughout the Greater Philadelphia area. The ideal person will collaborate with the current business development and estimating teams and will be responsible for: meeting with prospective clients, troubleshooting building failures, preparing cost-based pricing proposals and maintaining communication with contacts. Prior experience is a must. Compensation will be commensurate with experience. If you are the right candidate, send your resume to: stephen@mararestoration.com. All emails will remain confidential.

Project Engineers/Managers and Superintends

Concrete Protection & Restoration, Inc. is seeking qualitied new team members. Positions available for our Maryland office are Project Engineers/Managers and Superintends. Candidates with a College Degree(s) with a highly motivated, self-starter, strong interpersonal with communication skills please apply. Experience in general building practices and knowledge, hi-rise, façade, waterproofing and all aspects of concrete repairs with 3+ years of experience in construction repair please apply. Visit our website at www.concretecpr.com email resume to nsmith@concretecpr.com.

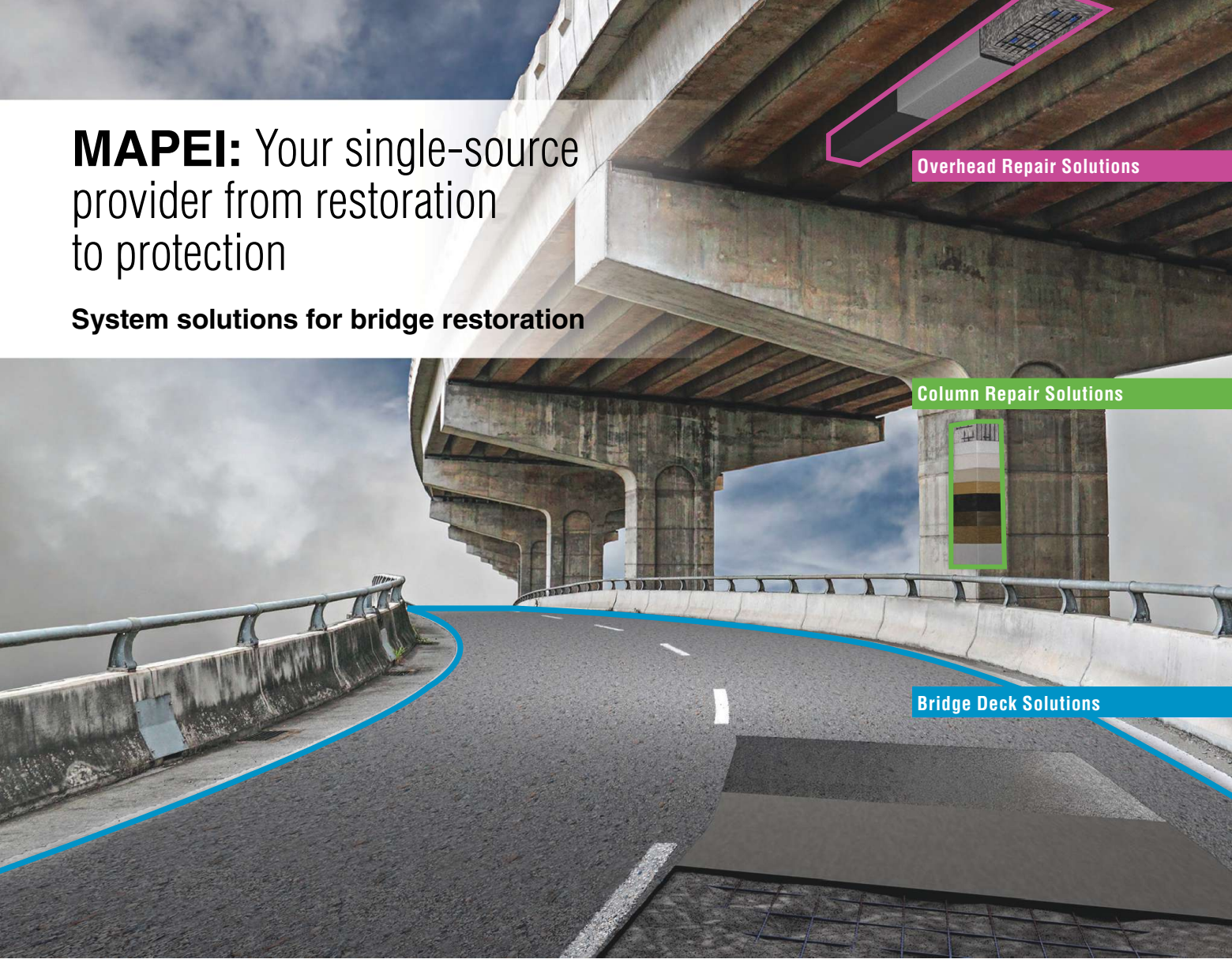
INDEX OF ADVERTISERS

INTERNATIONAL CONCRETE REPAIR INSTITUTE

1000 Westgate Drive, Suite 252 | St. Paul, Minnesota 55114 USA
Phone: +1 651-366-6095 | Fax: +1 651-290-2266
Web: www.icri.org | Email: info@icri.org

MAPEI: Your single-source provider from restoration to protection

System solutions for bridge restoration



Overhead Repair Solutions

1. Reinforcing steel
2. *Mapeshield™ I* (anticorrosion galvanic anode)
3. *Planitop® XS* (hand-applied repair mortar) or *Planitop 12 SR* (low-pressure spray mortar)
4. *Elastocolor® Coat* (protective and decorative coating)

Column Repair Solutions

1. *Planibond® 3C* (corrosion inhibitor)
2. *Planitop 11 SCC* (self-consolidating concrete mix with silica fume and corrosion inhibitor) or *Planitop XS* (hand-applied repair mortar) or *Planitop 12 SR* (low-pressure spray mortar)
3. *MapeWrap™ Primer 1* (saturant)
4. *MapeWrap 11* or *MapeWrap 12* (epoxy smoothing putty)
5. *MapeWrap 31* or *MapeWrap 21* (epoxy saturant)
6. *MapeWrap C Uni Ax 300* or *600* (carbon fiber fabric)
7. *MapeWrap 31* (epoxy saturant)
8. Sand broadcast
9. *Elastocolor Coat* (protective and decorative coating)

Bridge Deck Solutions

1. *Mapefer™ 1K* (anticorrosion coating)
2. *Planitop 18 ES* (rapid-hardening repair mortar) or *Planitop 18* (very rapid-hardening repair mortar)
3. *Planiseal® LVB* (crack healer/sealer)
4. *Planiseal Traffic Coat FS* (fast-setting epoxy overlay for bridge decks)

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

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

www.mapei.com

MAPEI®

ADHESIVES · SEALANTS · CHEMICAL PRODUCTS FOR BUILDING

SikaTop® REPAIR MORTARS

INDUSTRY'S **MOST TRUSTED** REPAIR MATERIAL FOR PERFORMANCE AND RELIABILITY

- No cracking >70 days per ASTM - C 1581
- PDS compliant to ICRI PDS Protocol-Guideline #320.3R
- A track record of 40+ years
- Excellent shrinkage results - 4 different industry standards
- Recipient of numerous ICRI project awards
- Factory proportioned kits
- Independant test reports available

SIKA CORPORATION
201 Polito Avenue • Lyndhurst, NJ 07071 • 800.933.SIKA • usa.sika.com

BUILDING TRUST