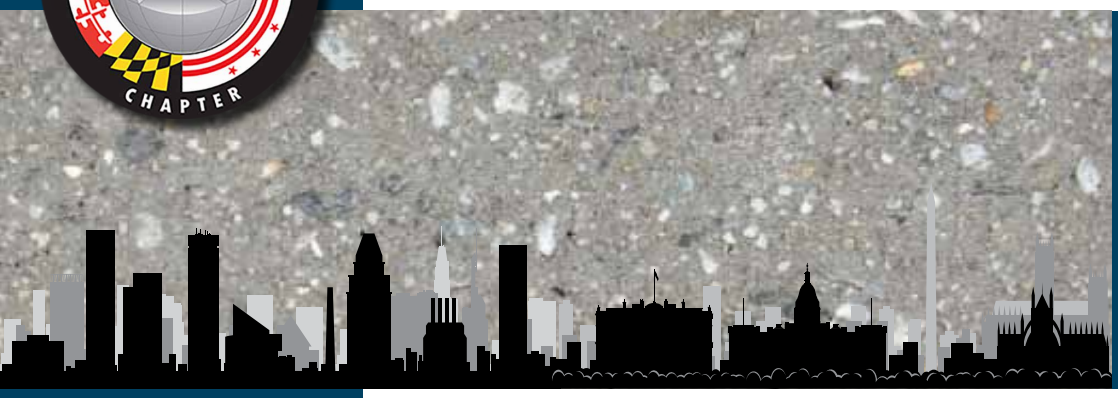
2nd Quarter
2017

The Aggregate

The Newsletter of the Baltimore Washington DC Chapter of ICRI



In This Issue:

Chapter Calendar

2nd Quarter Dinner Meeting
Gaithersburg Marriot Washingtonian Center
May 4, 2017

Call for ICRI-BWC Outstanding Repair Project Applications
June 5, 2017

ICRI-BW Chapter Board Meeting
August 17, 2017

3rd Quarter Dinner Meeting
September 7, 2017

ICRI-BWC 26th Annual Golf Tournament
October 5, 2017

4th Quarter Annual Awards Banquet
November 2, 2017

The ICRI National 2017 Fall Convention
Hyatt Regency New Orleans, New, Orleans, LA
November 15-17, 2017

Fall Technical Seminar
December 7, 2017

Message from our President

Shannon Bentz Desman


Shannon Bentz

Has anyone noticed the new BW chapter logo? Justin Long (SK&A) began with his own simple yet creatively striking idea which was then professionally incorporated into the new image, which was subtly introduced at the beginning of the year.

Other changes also include new BW chapter management. Brad Aderhold with Adverse Creations has fulfilled the management team role for our chapter. His first priority was to update our chapter website to include our new image with easier navigation. The information you need most often from our chapter will be at your fingertips. As I write to you today, the website is being finished and should be live. Take a look! http://www.icribwchapter.org/ if there are any issues with the website, please feel free to email me directly at sbentz@desman.com so that we can address them quickly. You will soon notice style and format changes with our upcoming Aggregates and Meeting Flyers.

Also on our local management team for this first year is Rochelle Brown (DESMAN). She will be handling some of the local correspondence and questions. If you aren't sure who to contact, your BW chapter Board of Directors, regional representative, as well as the BW chapter management team can all be reached with a single email address icribwc@gmail.com. Any emails received will be directed to the appropriate person for a prompt response.

As always, we strive for Chapter of the Year. Following the Spring Convention, we came home with Chapter of Excellence while Chapter of the Year went to Florida. Our Board of Directors will continue working hard throughout the remainder of 2017 so we can strive to obtain this honor for 2017. If you are interested in attending ICRI national conventions in the future, please let your president know. We are always looking for new delegates from the BW chapter to attend (which comes with a rebate on the cost of attending). If you are planning on going anyway, why not represent your local chapter.

Our next dinner meeting will be on May 4th at the Gaithersburg Marriott Washingtonian. We are finalizing our speaker for the evening and flyers should be seen soon if not already. Register early to avoid a wait at the registration table.

I look forward to seeing all of you at this dinner meeting, and please reach out to me at sbentz@desman.com if you have any suggestions for this year or feedback for me or the board.

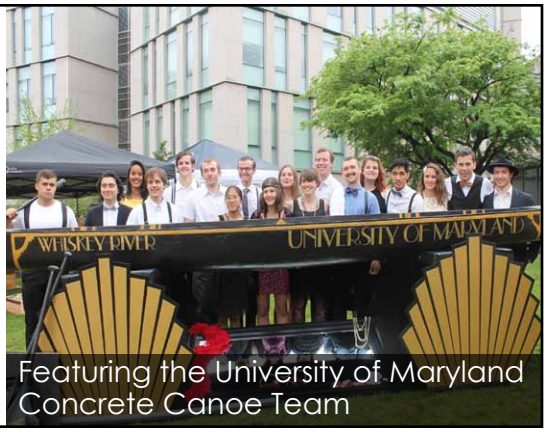
Shannon

2nd Quarter Dinner Meeting
Thursday, May 4th, 2017

Gaithersburg Marriott Washingtonian Center
9751 Washingtonian Blvd
Gaithersburg, MD 20878

Registration Deadline: **April 28, 2017**

Details and Registration Form in This Issue
OR
Register Online at www.ICRIBWChapter.org



Featuring the University of Maryland Concrete Canoe Team

2017 Joint ICRI-BWC & NCC-ACI Dinner Meeting

By Michael Payne

On February 9th, The ICRI-BWC continued its annual tradition with the National Capitol Chapter of ACI (NCC-ACI) for another successful joint meeting for the 1st quarter dinner meeting held at Maggiano's Little Italy in Tysons Corner, VA. Those who were able to attend had the chance to meet and network with their ACI counterparts during an enjoyable happy hour and family-style dinner that seems to always please. A group of student members of ACI from Howard University were also in attendance at the meeting and were welcomed by all as they got a glimpse of what a professional organization is all about.

National Capital Chapter

With a packed house of just over 100 individuals, Carla Ramo, P.E. of Tendon Systems LLC took the spotlight as the featured speaker of the night. Ms. Ramo traveled from the Florida to present on the causes, costs, and solutions of concrete structure deterioration. Her presentation began with an introduction to common concrete failure modes, and she continued with a discussion of the 5 times 5 rule indicating proactive protection in concrete design having the ability to save owners significant cost in eventual concrete repairs. The presentation ended with Carla discussing numerous repair and prevention methods employed throughout the concrete industry, including post-tension repairs, FRP strengthening, cathodic protection, and application of zinc- or other metallic-based anodic pastes to the surface of concrete bridge decks.

With the group finishing up the always-generous portions of dessert set at each table, the night ended with some final comments from the NCC-ACI board President and continued conversations amongst friends and colleagues as they filed out of yet another successful joint ICRI/ACI dinner meeting at Maggiano's.

Maryland State Procurement Change Order Fairness Act

By Jennifer Mahar

New to Maryland law is the Maryland State Procurement Change Order Fairness Act, MD Code, State Fin. & Proc. § 15-112. This Act applies to Maryland State procurement contracts for construction except public school construction and public school capital improvement projects.

Now prime contractors and subcontractors on state construction projects covered by the Act cannot be required to begin change order work until the state procurement officer issues a written change order directing the work to proceed and specifying the method by which the work will be paid (i.e., agreed-to price, force account, construction change directive or time and materials basis). On State Highway Administration or Maryland Aviation Administration construction projects, the written change order requirement can be met by a written acceptance letter that will have the same effect until the Administration follows up with a written change order.

> *"It is too early to tell what effect this Act will have on the administration or performance of state construction contracts."*

The Act also requires prime contractors to provide copies of executed written change orders to affected subcontractors and to advise the subcontractors of the payment amount they will receive for work performed under the change orders.

It is too early to tell what effect this Act will have on the administration or performance of state construction contracts. Given the length of time it takes for some state agencies to process written change orders, the new requirements may delay work. The Act is likely to create confusion for prime contractors and subcontractors assessing their rights in instances where the State disagrees the work at issue is changed work as the Act retains the State's prerogative to compel performance of disputed work subject to a subsequent claim process.

For further questions, Jennifer can be reached at jmahar@smithpachter.com or 703-847-6300. Jennifer, a member of Smith Pachter McWhorter, PLC, focuses her law practice on advising construction industry clients in all phases of project development and construction, including contract formation, project management, and dispute resolution.

ICRI Baltimore Washington Chapter
2nd Quarter Dinner Meeting

Thursday, May 4th, 2017

Gaithersburg Marriott Washingtonian Center
9751 Washingtonian Blvd
Gaithersburg, MD 20878

SCHEDULE:

4:00 pm Board Meeting
5:30 pm Social Hour
6:30 pm Dinner & Presentation

REGISTRATION:

Member Rate: $50
Non-Member Rate: $60
All after 4/28/17: $60

REGISTRATION DEADLINE IS APRIL 28, 2017

Company: _____

Name: _____

E-mail: _____ Phone: _____

Number of Attendees: _____ Attendee Names: _____

_____

The University of Maryland Concrete Canoe Team

The May Dinner Meeting will feature a presentation from members of the University of Maryland Concrete Canoe team. The concrete canoe program invites undergraduate students to compete in an annual competition to design, build and race a canoe made entirely of concrete. The 2016 canoe, Whiskey River, was triumphant in the Mid-Atlantic Region and competed at the National Concrete Canoe Competition in Texas.

Team members will be discussing their project from design inception and programming through the actual competition on the water. They will also make the presentation they are required to present in front of judges prior to the start of the actual rowing. Join us for what is sure to be an interesting program from some of the members of the next generation of concrete repair professionals.

Scan and email or fax this completed form to Chapter Secretary, Kevin Kline by April 28, 2017. Checks may be mailed with your form or you can bring them with you to the meeting.

Kevin Kline, EIT
Concrete Protection & Restoration, Inc.
2811 Lord Baltimore Drive
Baltimore, MD 21244
Fax: 410-298-4086
Email: kkline@concretecpr.com

Checks Payable to:
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The Templeton of Alexandria Condominium Project

By **D. Kipp Gaynor, PE**
Structural Rehabilitation Group

ABSTRACT

The Templeton of Alexandria Condominium is a fifteen-story cast-in-place concrete residential tower structure that features a landscaped elevated plaza deck and adjacent on-grade pool area located along the building's south elevation. The garage structure provides approximately 23,000 s.f. of on-grade parking which is located under the elevated plaza structure that utilizes a reinforced concrete structural slab supported by grade beams that span to caissons (deep foundations). The subject of this project is the elevated plaza structure over the garage which utilizes a cast-in-place post-tensioned reinforced slab constructed over the parking garage level.

The owners' original project goals were to implement targeted waterproofing repairs to isolated areas of the plaza that had been experiencing water intrusion over an extended period of time. Structural Rehabilitation Group, LLC (SRG) proposed to perform a structural survey to establish if the plaza was able to receive the desired targeted waterproofing repairs. During this survey it was determined that the structure was severely overloaded and required closure of the garage and plaza areas and emergency shoring installed. The plaza then required a complete tear off of the overburden, repairs to the post-tensioning system and elevated concrete deck and rehabilitation of the membrane waterproofing and drainage system as part of the Phase I work.

The owners' project goals expanded during the rehabilitation work to include strengthening the plaza structure to meet the Owner's future desired use as well as update the appearance of the plaza's landscape/hardscape architecture.

Challenges encountered and creatively resolved include repurposing of a concrete topping slab as a bonded overlay to increase load carrying capacity and simultaneously reduce demolition and disposal costs. Strengthening involved the addition of external reinforcing to increase load capacity in certain column bays. The surface of the plaza deck required enhancements to the drainage system to manage water off the plaza deck and topping slab surfaces. Perimeter under drains and membrane waterproofing were designed to redirect water from chronic water leakage locations.

BACKGROUND

The elevated plaza deck structure previously underwent renovation about 24 years ago (i.e. early 1990's). At that time, the repairs were reported to have included replacement of the waterproofing with a sheet applied rubberized asphalt membrane system, repairing some of the post-tensioning cables at isolated locations and installation of various landscaping and hardscaping treatments.

The 2014 investigation was performed to evaluate the condition of the post-tensioning system prior to implementing Owner requested targeted waterproofing repairs. The investigation was recommended by SRG as a precursor to any waterproofing work given that a number of concrete cracks, grease stains and water leaks were visible at the underside of the elevated plaza deck. Given the age and type of the post-tensioning system and historical information regarding that system, we understood that the tendons were vulnerable to moisture intrusion and corrosion.

Figure 1- Bird's eye view of the plaza (consisting planters, pavers, soil and hardscaping).

EVALUATION

The post-tensioning system was evaluated, to confirm the system was functioning as intended prior to spending financial resources on a targeted and limited waterproofing repair program.

Visual inspection revealed various cracks, concrete spalling, staining, and electrical conduits that were compromised by water. The superimposed dead loads (SDL) in place at the plaza level (consisting of planters, pavers, soil, plantings and hardscaping) were measured (field verified) and determined to exceed the published design capacity noted on the original design documents.

The structural drawings indicated that the original plaza structure was designed for a SDL of 50 psf

while our loading estimates for portions of the plaza were as much as 300 psf. Cracking in the soffit of the slab in certain mid-span areas as well as cross (X) cracking in one bay led us to perform intrusive sampling in those regions. The following is a brief summary of significant findings from the survey work and analysis:

Figure 2- Cracking and water intrusion through the slab as well as slab-to-wall transition.

Figure 3- Corrosion of the surface mounted and embedded electrical conduits and junction boxes were visible at the underside of the concrete slab.

Figure 4- Cracking on the surface of the concrete slab aligned with the electrical conduits at mid-span.

• The soffit of the post-tension plaza slab exhibited numerous areas of distress in the form of cracking and water leakage. Cracking along with calcium carbonate accumulations including stalactites indicated that the plaza water intrusion had been on-going for an extended period of time.

• Corrosion of embedded steel reinforcing and electrical conduits as well as surface mounted junction boxes, and leakage around drainage pipe penetrations.

• Several cracks were observed in the column strips while other cracks aligned with embedded electrical conduits.

• Discoloration of the concrete resulting from the escape of the grease from the un-bonded tendon sheath/covering.

• During the intrusive sampling, several abandoned electrical conduits were encountered. Water was found to be dripping out of the conduits.

• At the exposed post-tensioning tendons, a preliminary field test was performed to help establish if the tendons remained under tension. Seventy-three post-tensioning tendons were exposed as part of our investigation, of which 23 tendons were oriented in the north-south direction. Of those 23, four (4) were found to have lost post-tensioning force. In the east-west direction, a total of 50 tendons were exposed. Of those 50, nine (9) were found to have lost all tension and nine (9) were found to have a partial loss of the stressing force. Water was observed to be dripping from the sheathing of several of the exposed tendons.

• Finite Element Modeling software was used to perform an engineering analysis of the plaza structure. The results of the computer analysis revealed that the loss in post-tensioning force significantly compromised the structure's load carrying capacity. The analysis also revealed that the existing post-tensioned slab was not code compliant to today's standards given a number of deficits in the slab construction. The analysis indicated that absent having all the original tendons functioning as intended, there should be no live load applied to the plaza slab and that the plaza needed to be closed immediately due to life safety concerns and shored to protect the public and workers.

EMERGENCY LOAD REDUCTION

The client was immediately notified that the plaza as well as all of the covered parking area needed to be closed to both vehicular as well as pedestrian access in the regions where excessive loading existed. The vehicular parking was closed under the plaza deck below the greenscaped and landscaped areas. An emergency shoring solicitation was undertaken and a Contractor was retained. Shoring was installed and a zero live load plaza restriction was mandated for the area, so the parking bays below the tennis court area could be reopened. The plaza level remained closed to pedestrians, however, pedestrian access at the garage level was restored in a defined walkway to accommodate building core access below the shored work area.

Figure 5- Shoring for plaza during the emergency load reduction phase.

The overburden was then removed and the debris was disposed of. The removal process revealed a surface that had been overlain in areas with a concrete topping slab that was used to infill areas between the masonry planter/site walls. The troughs that remained once the walls were removed required infilling to simplify the future membrane waterproofing installation.

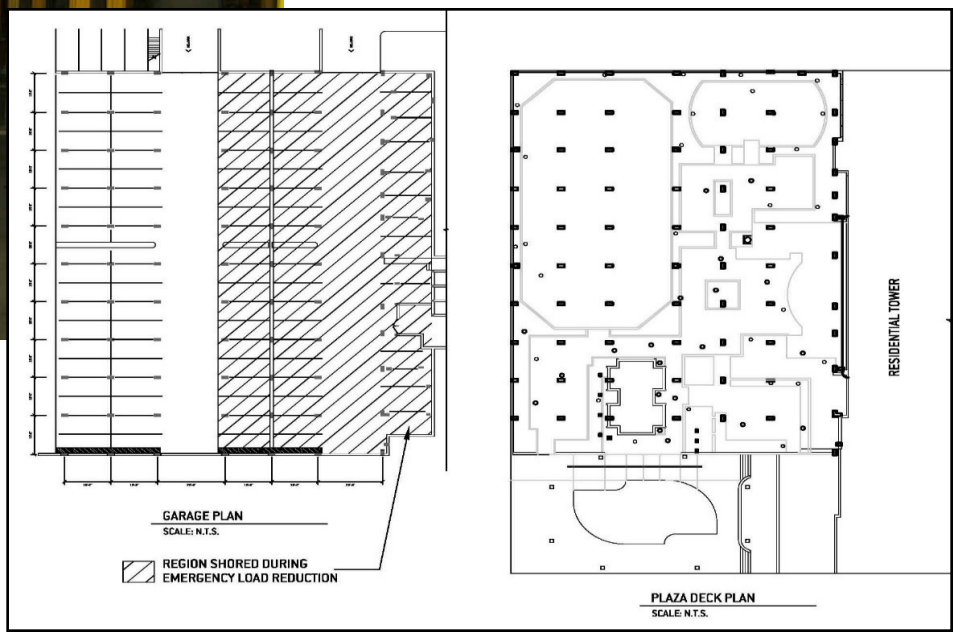

Figure 6- Plaza and garage plan (hatched area shows the region requiring shoring during emergency load reduction).

STRUCTURAL, ARCHITECTURAL AND / OR OPERATIONAL IMPROVEMENTS

Additional structural capacity was designed into the structure to meet the Owner's project requirements The analysis of the plaza deck revealed a severely limited load carrying capacity. Restoration of the un-bonded post-tensioning tendons was performed to restore the integrity of the original design. In addition, targeted bays with longer spans were studied and the use of external strengthening facilitated the repurposing of the elevated plaza structure with increased capacity to accommodate the Owner's desired amenities and hardscaping/landscaping.

In total, 69 tendons were repaired (spliced) or completely replaced as part of the Contractor's work plus the installation of the external reinforcing. The rehabilitated post-tensioned and externally reinforced slab was designed to safely support a live load of 100 psf along with a SDL of 100 psf.

Drainage enhancements and installation of emergency overflow systems

The as-built topography of the existing topping slab and in-situ drain layout were incorporated into the new design. Supplemental drains were installed after the deck was surveyed to establish low spots.

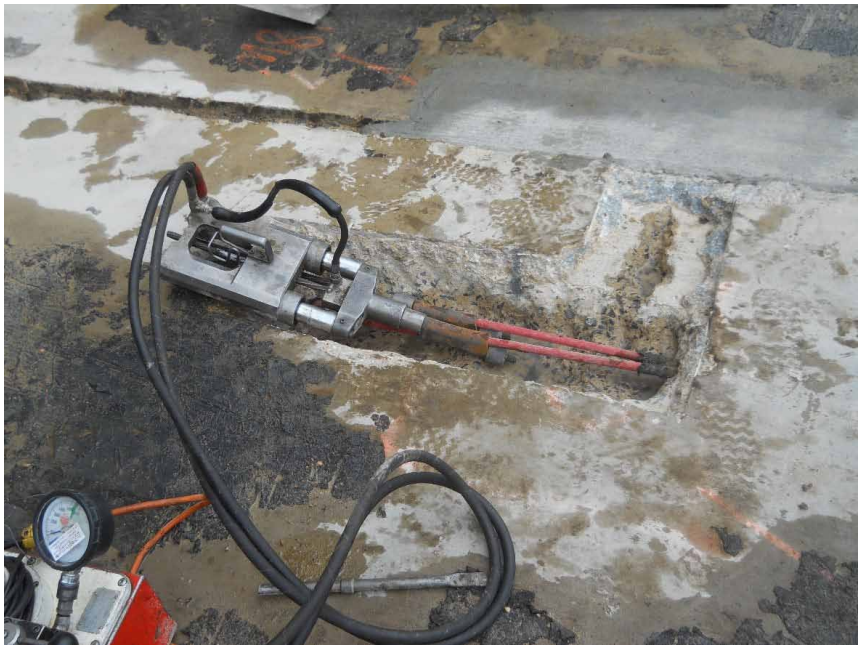

Figure 7- Stressing of the post-tensioning tendons after replacement.

TECHNICAL INNOVATION

Careful consideration and re-purposing of as-built conditions saves client money

When the emergency load reduction work was completed, it was revealed that the renovation performed in the 90's included the addition of concrete topping materials to enhance drainage. A network of troughs/trenches remained where the prior site walls existed. These troughs were problematic in detailing the waterproofing system and the topping slab/overlay represented additional dead load on a deck that was already overloaded and under designed. In evaluating the options to address the topping/deck profile issues, three (3) remedial options were considered as follows:

- Remove all the toppings down to the structural deck to reduce the SDL.
- Leave the existing topping in place and infill the trough/trench areas to facilitate simplification of the future waterproofing system and water management design. This would require that the future SDL be reduced by the weight of the as-built topping materials.
- Leave the existing topping in place and prove by testing and analysis that the toppings were acting compositely with the existing structural slab. If confirmed, this would result in a net increase in the plaza decks as-built live and dead load capacity by increasing the center of gravity (CG) of the slab.

Pull off testing work was performed to establish the adhesion of the toppings. The topping slab pull off tests revealed sufficient adhesion to confirm that the toppings were well bonded and could be considered to be acting compositely with the structural slab. These findings resulted in a significant cost savings to the Owner in reduced labor and disposal fees as well as substrate preparation related costs. The repurposing of the in-situ toppings not only saved the Owner rehabilitation demolition costs and time but also provided a green alternative by reducing the impact on our planet from the demolition and disposal related activities.

Figure 8- Plaza demolition revealed topping slabs that overlaid the structural deck.

Figure 9- Pull off testing performed to evaluate the adhesion of the in-situ toppings.

Figure 10- Toppings added dead load but also increased the decks load capacity by leveraging a greater "d" between CG and tendon centerline.

Strengthening of the Structure

Strengthening of the existing structure utilized an external post-tensioning system treated with an intumescent coating. Steel column collar brackets were installed to anchor the tendons as well as provide supplemental shear reinforcement at the column-to-slab connections. Mid-span deviators were installed to provide sufficient profile geometry for the tendons while maintaining head room in the garage space. External forces were then applied to the tendons and desired uplift forces were delivered to the concrete slabs at mid-span to mitigate excessive bending stresses in the longer column strips.

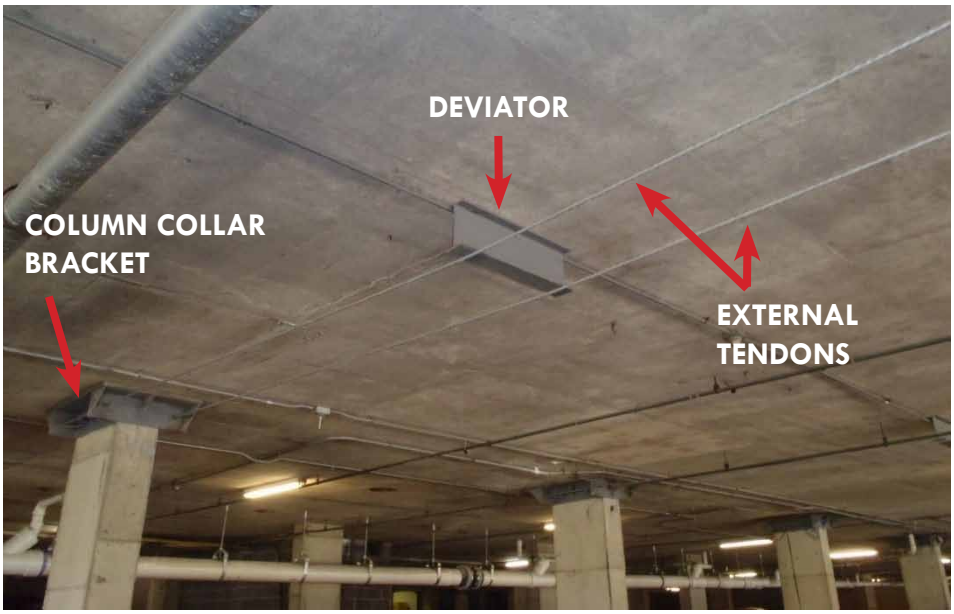

Figure 11- Steel column collar brackets and intermediator deviators were installed.

Waterproofing and Drainage Enhancement Design and Other Considerations

Due to the anticipated delay between the design and implementation of the structural repairs and the future surfacing and amenity implementation work (that was still in the preliminary design phase), SRG recommended that the Owner proceed with the waterproofing work to protect the plaza structure from moisture intrusion. The plaza deck was then covered with a reinforced hot rubberized asphalt membrane and the membrane was covered with an aggregate surfaced cap sheet as a protection layer.

A hydrostatic flood test was performed to satisfy the Owner, Engineer and Manufacturer that the system was well crafted and met the requirements to obtain a warranty.

CONCLUSION

The project was a challenging plaza strengthening and structural rehabilitation project. The Owner's initial desire was to perform targeted leak repairs to the plaza deck with the intent to defer the cost of a plaza waterproofing project for as long as possible. The pre-design survey revealed that the structure was not safe and a significantly more urgent condition existed that required emergency stabilization and structural repairs.

The emergency project required a coordinated and collaborative effort between various design team members, Board Members (Owner) and several Contractors to achieve the desired goals. The lesson learned from this project is that implementation of topical repairs to "buy time" will not work if the underlying structural conditions demand attention now.

The achieved results include a greatly extended service life as well as reduced future maintenance costs of the plaza deck/garage structure and the opportunity to create an updated amenity space that will serve the building users well into the future. The plaza is now ready to become an active and vibrant centerpiece for the occupants of the building which will revitalize the plaza into a meeting place and outdoor activity center for the community and be serviceable for years to come.

D. Kipp Gaynor, PE
Structural Rehabilitation Group

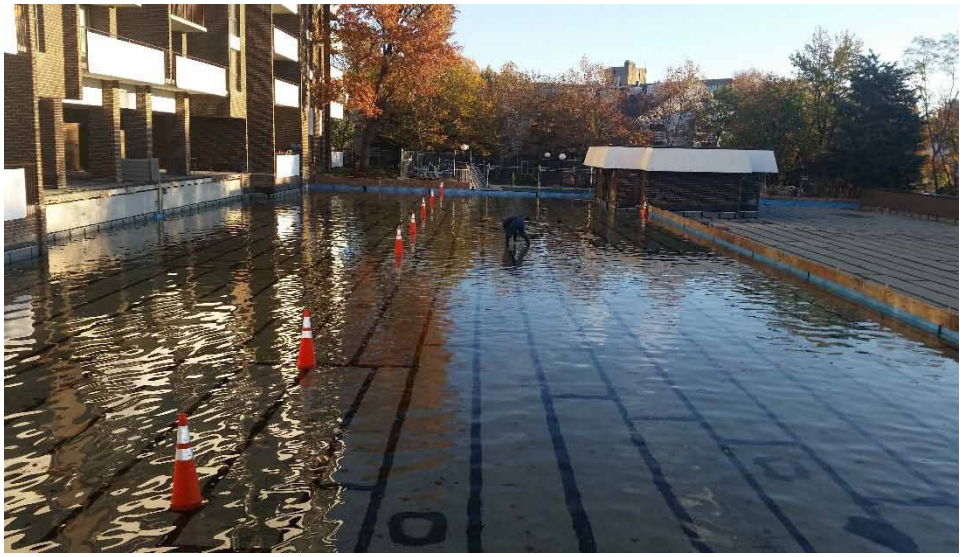

Figure 12- Up slope hydrostatic water test performed to validate the waterproofing system installation.

Figure 13- Down slope hydrostatic validation water test.

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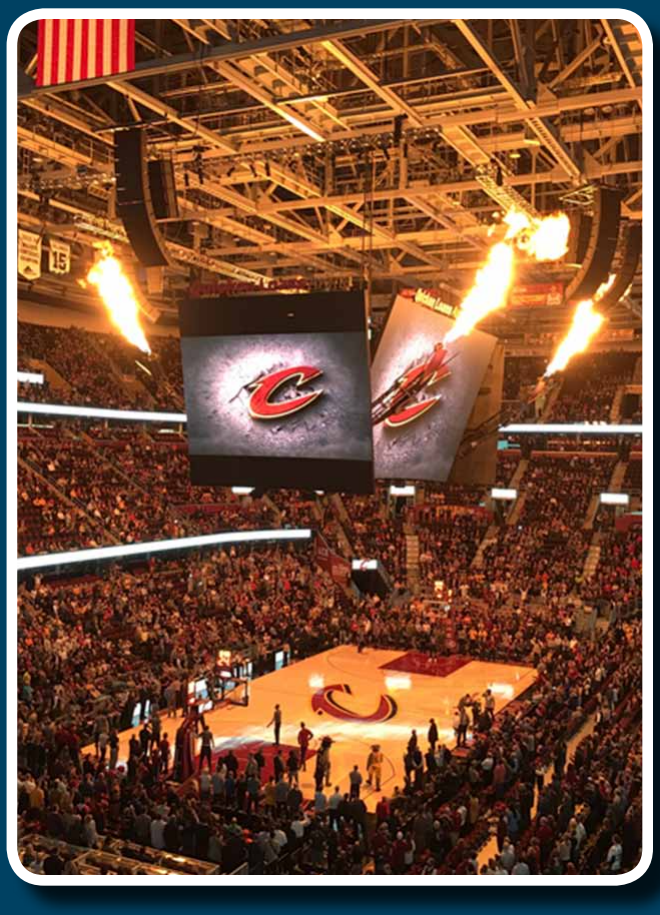
The 2016 Fall Convention was held in Cleveland, Ohio. The city that rocks!!

Cleveland is the 48th largest city in the U.S. and the 2nd largest city in the state of Ohio after Columbus. As always, there was a good showing from the ICRI Baltimore-Washington Chapter with many of our local members in attendance. The convention was held at The Westin Cleveland Downtown just blocks away from Cleveland's nightlife with many bars and restaurants. Due to the downtown location, attendees were, not only able to enjoy the convention events and comfort of the hotel, but were also able to explore everything else Cleveland has to offer.

Welcome Reception

The first social event was the Welcome Reception on Wednesday night. This event is always well attended and ICRI members from all over the country spend their time walking through the exhibits, snacking on finger foods, and waiting in line at the bar while chatting with friends and colleagues. Afterwards, many attendees left the hotel and wandered downtown to enjoy more food and drink at one of the many restaurants.



Opening Luncheon

Jason Goldberg was the keynote speaker at the Opening Luncheon. He shared his life story and his transformation from a stressed out tech career to a more "care free" or "not-so-serious" life style. He talked about how we can sometimes be our biggest adversary and before we get upset or stressed over work, we need to stop and think for a second about how it doesn't actually matter. Just don't take life too seriously. Learn to enjoy things more and don't get worked up over the little things. It was a very entertaining and thought-provoking presentation.

Technical Sessions

There was no shortage of interesting technical sessions at this convention. I especially enjoyed the presentations on the unique repair projects from across the country. The presentation on the Evaluation of the Historic Water Valve Vaults in Minneapolis was particularly intriguing. The process of evaluation was interesting and it was pretty eye opening to see the level of disrepair in some of the vaults. A few were so bad that they were not even able to go inside and look around to assess the damage. Instead, the initial step was to fill them with sand and grout until later when an actual repair could happen. I also found the presentation on the Floor-to-Floor Slab Replacement at the UPMC Victoria Garage in Pittsburgh, PA to be very interesting. I really enjoy watching presentations on other projects and learning about the different challenges they face and how they overcame them. On this project, due to structural restrictions, they could not fully remove the existing Button Head PT cables all the way to the wall at the end anchors, so in order to install the new Monostrand PT cables, they had to develop a custom splice for every single cable. Overall the technical sessions were very informative.

Technical Committee Meeting

Thursday morning I attended the (120) Environmental Health and Safety Committee. They discussed ways to get the word out about the new OSHA silica dust standards and also proposed the idea of an ICRI yearly safety award. This would be scored similar to the project of the year awards and member companies could submit applications to be recognized at the Fall Convention. The committee members were going to discuss the idea with the Awards Committee and hopefully get the ball rolling. With the impending changes to the silica dust standards, the safety award seemed like a good way to get the word out while promoting safety in our industry and recognizing those companies who go above and beyond.

Inter-Chapter Luncheon & Chapters Committee Meeting

I attended the Inter-Chapter Luncheon where I ran into some friends I had met at the roundtable in Philadelphia. It was interesting to hear from the other chapter leaders and meet some new contacts. The presentation topic was on the new ICRI Concrete Surface Repair Technician Educational Program and certification. After the luncheon, we all attended the Chapters Committee meeting. The committee discussed the previous roundtables and upcoming roundtable schedules. There was also discussion about the Chapter Delegate Program on how to increase participation and make the process easier with the use of the new sign-up procedure. At the meeting, the application from the new Toronto, Ontario Chapter was initially approved and everyone welcomed the new group. Everyone is looking forward to their participation at the spring convention.

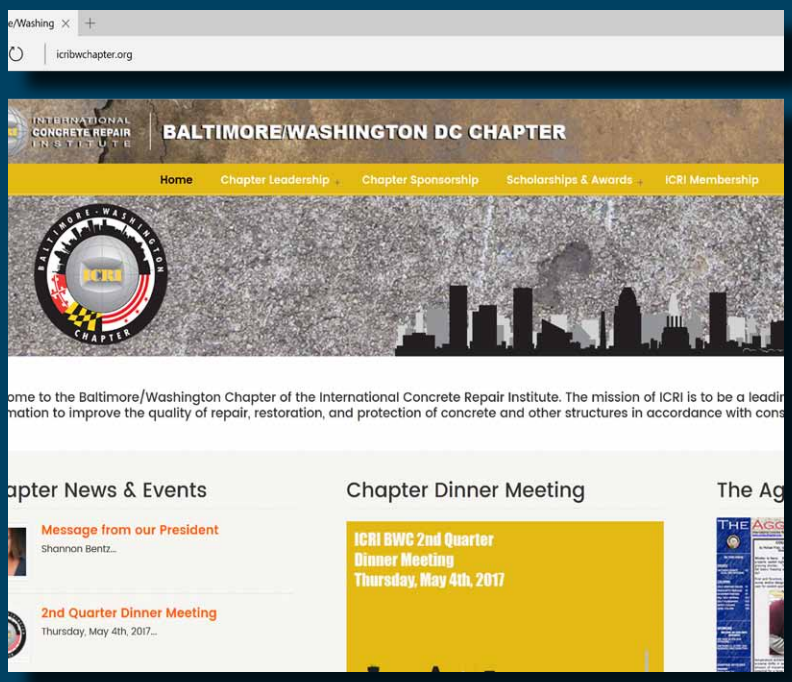
Rock & Roll Hall of Fame

On Friday night a large group attended the Rock and Roll Hall of Fame Celebration which was hosted by the Northern Ohio Chapter. There was a live band, bar, and appetizer buffet. I enjoyed wandering around the exhibits, seeing all the memorabilia and watching all the different videos displays of old bands and rock & roll performances. One of my favorite exhibits was the theater where they showed old episodes of Dick Clarks American Bandstand. Truly an American classic.

Overall my delegate experience at the convention was a good one. The event was well planned and provided many opportunities for attendees to learn as well as interact with colleagues outside of the work environment. I would absolutely recommend all B-W chapter members become involved on a national level and attend at least one convention.

Contributed by **Kevin Kline**
Concrete Protection & Restoration, Inc.

The Chapter has a new website:



Check out the all new www.ICRIBWChapter.org

2017 Chapter Officers

PRESIDENT
Shannon Bentz, P.E.
DESMAN
sbentz@desman.com

VICE PRESIDENT
Robert A. Radcliff, P.E.
Engineering & Technical Consultants, Inc.
bradcliff@etc-web.com

SECRETARY
Kevin Kline, EIT
Concrete Protection & Restoration, Inc.
kkline@c-p-rinc.com

TREASURER
Brian Baker
PPSI
brian@ppsimd.com

IMMEDIATE PAST PRESIDENT
Adam Hibshman
Valcourt Exterior Building Services
ahibshman@valcourt.net