

THE NEWSLETTER OF THE BALTIMORE WASHINGTON DC CHAPTER OF ICRI

2ND QUARTER 2021

CHAPTER CALENDAR

JUNE 7 – 10, 2021 WORLD OF CONCRETE -LAS VEGAS, NV

AUGUST 13, 2021 ICRI-BWC BOARD MEETING RAMS HEAD @ SAVAGE MILL, MD



THE AGGREGATE

- PRESIDENT'S MESSAGE
- SAFETY & LEGAL
- , GOLF OUTING RECAP

MESSAGE FROM OUR PRESIDENT

BRIAN RADIGAN - TREMCO COMMERCIAL SEALANTS



I hope this message finds you and your families safe as we begin to emerge from the restrictions brought on by COVID-19 pandemic. We have a lot to look forward to as the country and the rest of the world works toward getting back to normal. The widespread distribution of vaccines and lowering cases are beginning to signify that there is a light at the end of the proverbial tunnel. I know you are all eager, as am I, to get back out there and see each other again.

While regular dinner meetings had to take a necessary backseat to local restrictions, it was great to see many of you at last week's Spring Golf Tournament. Our first event in 2021 was held at Westfield's Golf Club (in Clifton, VA). The Board was humbled by the support of the Chapter members at this first outing, in over a year. We had 90+ members come out to play in this refreshing change of pace. The event was a success that we will be looking to repeat in

the Fall. I want to thank our Golf Committee (Brian Baker and Taylor Crampton) for their efforts in setting up such a great event.

In other Chapter business, the Scholarship Application is now available for college students (please see the website for complete details). If you know of anyone in a field of study that is relevant to our Industry, please pass along the word to them. Applicants can contact Dominic Huey who is the chair of the Education and Scholarship Committee at dhuey@structural.net.

Additionally, the Board has recently elected to allow for "Committee members" to participate in the Chapter's activities. While these members will not officially sit on the Board, they will be able to help a specific Board Committee in its typical activities. It is a great way to get involved with the Chapter a little deeper and work towards becoming a Board member. If you are interested in becoming a committee member, please consider reaching out to one of the Committee Chairs below:

Membership Committee	Facilities Committee	Programs Committee	Newsletter & Communications	Nominating Committee
- Maintain Chapter membership list	- Schedule Events (speakers and locations)	Searches and reaches out to speakers for events	Responsible for coordination of each quarterly aggregate	- Organize Board elections
- Welcome new members	- Provide PDH info	Liason for the board at National	Maintains a backlog of industry related content	 Nominee for Convention Delegate
 Reach out to expired members for renewal 	- Track event participations			 Nominee for Regional Roundtable
- Review potential markets for membership	Provide event summary for inclusion in CRB			 Notify membership of nominations
Taylor Crampton	Brian Baker	Tom Ouska	Mike Camarda	Rich Barrett
tcrampton@concretecpr.com	Brian@ppsimd.com	touska@valcourt.net	michaelo@skaengineers.com	rich@lymtal.com
Sponsorship Committee	Chapter Awards Committee	Golf Committee	Education & Scholarship Committee	Industry & Community Outreach
- Acquire event / chapter sponsors	Local Chapter Awards	Runs the whole process of setting up the Golf Tournament	- Coordinate with local colleges and Universities	Coordinates with local colleges and Universities for
- Maintain sponsorship levels	Same Criteria as National Awards but Local		- Review potential scholarship opportunities	events that affect our industry
Create sponsor banners for display at events	Pick a panel to judge projects		- Present to local colleges / Universities	
			 Maintain contact list at universities / colleges 	
Rich Barrett	Luke Valentine	Taylor Crampton	Dominic Huey	Kevin Goudarzi
rich@lymtal.com	typientine@etc-web.com	terampton@concretecpr.com	shuev@structural.net	kevin goudarzi@efiglobal.com

VISIT US AT: ICRIBWCHAPTER.ORG

In other Industry related news, National has just recently released their picks for their Annual 40 Under 40 Review. This event selects forty members from Chapters all around the country (under the age of forty of course) and three of our members were chosen for recognition! Please join me in congratulating Taylor Crampton (of CP&R), Michael Camarda (from SK&A) and Joseph W. Wilcher III (from Walker Consultants). We are lucky to have this new generation of Industry Leaders on board!



Joseph W. Wilcher III, PE Consultant—Building Envelope, Forensics & Restoration Walker Consultants



J. Michael Camarda, PE Project Manager SK&A



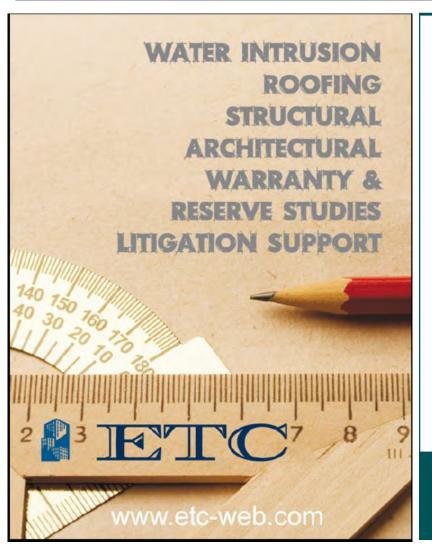
Taylor Crampton
Project Manager
Concrete Protection
and Restoration

For future events, we will continue to monitor the status of local restrictions and plan meetings in accordance with them. We are doing what we can to keep things moving forward at the ICRI Chapter level. The safety and wellness of our Members continues to be a top priority. Please keep checking the website for updates to events. We will also be sending out notices as event arise.

I want to thank every one of you for your engagement, continued dedication for the Chapter! Its with your support that we can weather the crisis. I look forward to seeing each of you in person soon. We're almost there!

Please feel free to contact me at bradigan@tremcoinc.com with any comments and suggestions for the remainder of the year.

Brian





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THE PURPOSE OF THE DIFFERING SITE CONDITIONS CLAUSE

by Kenneth K. Sorteberg, Esquire

The Federal Government long ago recognized that one of the greatest risks in a construction contract was encountering unforeseen subsurface conditions. A prudent contractor would include a contingency in its bid to protect itself from such a potential problem. If a problem never materialized, the government incurred an unnecessary expense, paying more than necessary for the contract work. On the other hand, if a problem did materialize, and the contractor's contingency was insufficient to cover the added costs, the construction of the project might be disrupted and delayed while the contractor sought instructions, filed claims or halted the project for lack of funding.

To avoid such issues, the government developed the risk-shifting 'Differing Site Conditions' clause. This clause minimized the contractor's risk and relieved the contractor from unexpected conditions that could not be ascertained by a reasonable site investigation. It promised the contractor an equitable adjustment if subsurface or latent physical conditions at the site differed materially from those indicated in the contract or were of an unusual nature differing materially from those ordinarily encountered. The clause works both ways, benefiting the government if the actual conditions were less onerous than anticipated. The policy supporting this clause was described by a 1970 Court of Claims case, Foster Construction, C.A. v. United States:

The purpose of the changed conditions clause is thus to take at least some of the gamble on subsurface conditions out of bidding. Bidders need not weigh the cost and ease of making their own borings against the risk of encountering an adverse subsurface, and they need not consider how large a contingency should be added to the bid to cover the risk. They will have no windfalls and no disasters. The Government benefits from more accurate bidding, without inflation for risks which may not eventuate. It pays for difficult subsurface work only when it is encountered and was not indicated [in the contract documents].

Please feel free to contact Ken Sorteberg@constructionlaw.com with any questions or suggestions for future Legal Columns. Mr. Sorteberg is a civil engineer and an attorney (licensed in MD and DC) who focuses his practice on construction law.

PROVIDING A CLEAR EGRESS

By David Caple

Many restoration projects involve conditions that make entering and exiting the jobsite complicated.

A few things to consider:

Complications can include storage of debris, equipment, materials, and use of shoring and formwork

to name a few. When walking a jobsite the field managers should assess the site for situations where this hazard may arise. OHSA states in its rules that a contractor shall provide and maintain free and unobstructed egress from all parts of an occupied building. In addition, exits shall be marked by readily visible signs. In recent

talks with other local safety professionals this is an item that OSHA has been citing frequently, most recently. Here are a few tips that could help you avoid costly fines, penalties and losses.

Simple Solutions:

For example, jobsites with tight shoring designs can be confusing in an emergency when an employee must exit the building through the work area. Marking the clear path through the jungle of shoring with "caution tape" or similar product is an easy and effective way to designate the proper route for egress. These isles must be kept clear of debris or other trip hazards. If a repair location falls in line with an exit sign or the conduit to the exit sign is damaged during demolition appropriate temporary measures need to be taken to mark the exit until the sign can be properly repaired or replaced. Never use a fire exit for storage and never lock or fasten a fire exit in a manner that restricts free escape from the inside when the building is or could be occupied.

Conclusion:

Field managers should be encouraged to review the emergency action plan for the jobsite with their employees. If your job doesn't have a plan, look for assistance from the safety department, a safety consultant, or management. You can help avoid injuries in the event of evacuation by following these few tips. For more information or to recommend a topic for a future publication contact me at d.p.caple@gmail.com

David Caple, COHC, CEAS

Construction Safety and Health Specialist, is the Principal Member of Pinnacle Safety Network, LLC. He has over 15 years experience in a combination of structural restoration and safety.

CONCRETE REPAIR CHALLENGES



INTRODUCTION:

During the last 30 years, concrete repair industry has come a long way in repair and rehabilitation of the existing structures. Due to the advancements in concrete repair technology, existing reinforced concrete buildings can now be kept in service longer and the long-term performance of these structures are ensured. New innovative materials such as carbon fiber reinforcing polymers, doweling epoxies, reinforcing polymers, various admixtures to modify the concrete properties and newly developed waterproofing systems have allowed the engineers to better rehabilitate and modify existing structures; however, there is still a great deal of unknowns

and nuances in concrete repairs, some which will be discussed in this article.

Exposed concrete elements experience considerable amount of corrosion related damage in parking garages, plazas, stadiums, podiums...etc. when deicing chemicals and moisture migrates into the concrete. Numerous research studies have been carried out to develop new methods and understand the performance of commonly used materials in traditional corrosion related concrete repairs. ACI and ICRI have collectively published a great deal of guidelines for repairing structural concrete, which has allowed the building owners and managers to successfully keep their buildings in service longer and avoided monetary losses due. Recently published ACI 562 is also a good guideline with valuable information regarding investigation, design, and execution of concrete repairs; however, various nuances in structural repair and rehabilitation are left up to the judgment of the registered design professionals specifying the repairs. The purpose of this article is to discuss some of these nuances in rehabilitation of reinforced concrete structures and provide the authors' opinions.

INSTALLATION OF POST INSTALLED ANCHORS IN REPAIRED CONCRETE:

First part of discussion will be regarding anchoring into repaired concrete members. This is a commonly encountered matter in structural repairs and modifications involving slab edges in buildings. Balcony repair and façade re-cladding projects are good examples where anchorage into repaired concrete maybe necessary. It is the authors' experience that a lot of specialty engineers, who are designing cladding and railing systems, either avoid placement of post-installed anchors into

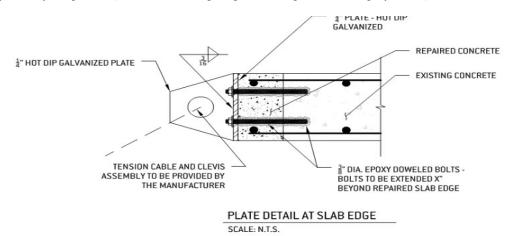


Figure 1

the repaired portions of the concrete slabs, specify anchors to be extended beyond the repaired portions of the slab edges or avoid the issue all together by asking the engineer of record to verify the field conditions. The concern with the performance of the slab edge repairs is understandable and there can be issues related to the quality of the concrete repairs; however, arbitrarily not depending on repaired concrete for installation of post-installed anchors greatly complicates the construction coordination and design process. It is the author's recommendation that the

engineer of record should provide sufficient information to the specialty engineers designing the anchorages for such systems to avoid coordination issues before the generation of shop drawings. If the field conditions are not well known, it is imperative to perform a field survey to find out the condition of the repairs during the design phase. If there are concrete spalls at the building edges, the engineer of record should provide appropriate details for repairing them and provisions for installation of post-installed anchors (Figure 1). The owners and architects who are working on the project must be informed that the structural engineers need to perform field surveys to document the existing conditions prior to designing repairs or alterations to the existing buildings. Every project is different and one may choose not to depend on the capacity of the repaired concrete areas if there are very high concentrated forces transferred to the patches or there are high sustained tensile forces (as in the case of tension rods anchored to slab edges). However, inadequate fieldwork to observe the existing conditions prior to design phase and not communicating with the members of the design team (including the specialty engineers) will only complicate the construction process.

USE OF APPROPIATE CONCRETE REPAIR MATERIALS:

Another common issue in concrete repair projects is the specification of appropriate repair materials and quality control. Although there is a great deal of research in this field, there is hesitance in utilization of such materials in repair applications. If the properties of specified concrete mixes are well understood and proper curing methods are specified, use of such materials will greatly benefit the project. There are several types of concrete materials for repair applications available in the market, such as Self-Consolidating Concrete (SCC), Shrinkage Compensating Mortars (SCM), High Performance Concrete (HPC), Fiber-Reinforced Concrete (FRC), and Rapid Set Mortars, etc. Rather than specifying one type of concrete for all types of repairs, several types of materials, suitable for the project requirements, can be specified to meet the project demands. Some of the available types of concrete and their applications in structural concrete repair is as follows:

Self-Consolidating Concrete (SCC)

Self-consolidating mortar or concrete was first developed in Japan in the 1980's. Flowability, passing ability and resistance to segregation are the three main factors that influence the quality of the SCC. In most of the cases, where a repair is performed in components of infrastructure or high-rise buildings with dense steel reinforcement, incorporation of SCC can reduce the labor cost and construction time. SCC can easily flow inside the formwork without any compaction (vibration) and cover the congested rebar within the formwork. Typically, SCC has a slump value of 8 inches or more.

To achieve a high level of flowability and resistance to segregation, higher paste-to-aggregate ratios are used in SCC mixtures; hence, more Portland cement is used to produce SCC mixtures than the conventional concrete mixtures. Higher dosage of Portland cement in SCC mixtures may cause higher risk of shrinkage and thermal cracking in repair materials.

Shrinkage-Compensating Concrete

Shrinkage Compensating Concrete is an expansive concrete, which expands equal or greater than sustained drying shrinkage. During the expansion phase, at early stages of the curing process, compressive stress is induced in the concrete

matrix. While the concrete is shrinking, the induced compressive strength will be reduced due to the shrinkage of concrete matrix; however, in most cases, a residual compressive stress will remain within the concrete matrix which prevents shrinkage cracking. The occurrence of expansion at early ages of the curing process is due to the formation of ettringite within the concrete mixture while the concrete mixture is still in the plastic phase. When the ettringite is formed within the concrete matrix, it occupies more space and consequently increases the volume of the concrete. Since the concrete is still in the plastic phase, the expansion of the concrete does not cause any distress or delamination to the concrete.

The presence of ettringite within the concrete mixture at early stages can influence the flowability of the mixture since ettringite absorbs more water and consequently affects the workability of the mixture. Thus, higher water-to-cement ratios are used when shrinkage-compensating concrete is as a repair material.

Picture 1: SCC in a Column Repair Application

High Performance Concrete (HPC)

High performance concrete mixes have higher levels of strength

and durability when compared to conventional concrete. Typically, this type of concrete mixes have lower permeability and denser matrices compared to conventional concrete mixes. HPC contains one or more types of admixtures, such as silica fume, fly ash or granulated blast furnace slag. HPC usually has higher percentage of cementitious materials and lower percentage of water (therefore a lower water-to-cement ratio) compared to the conventional concrete. Higher dosage of Portland cement in HPC may cause shrinkage and thermal cracking if precautions are not taken.

Fiber-Reinforced Concrete (FRC)

Fiber-reinforced concrete mixes contain discrete fibers. This type of repair materials have higher toughness, impact and cracking resistance as compared to conventional concrete. Fibers can be produced from glass, plastic, polypropylene



or steel. The amount and size of the fibers within the mix, in addition to the properties of the cementitious materials, influence the workability, mechanical properties and durability of the fiber-reinforced repair materials. This type of materials are suitable for pavement or slab repair applications where shrinkage and/or thermal cracking needs to be controlled.

PERFORMANCE OF REPAIRED CONCRTE BUILDINGS UNDER WIND AND SEISMIC LOADS:

Lastly, there has not been much research in performance of repaired (repairs performed to remediate corrosion damage rather than damage due to wind or earthquake events) concrete structures under seismic and wind loads. Though many concrete framed buildings have undergone

various degrees of repairs in the coastal regions of the U.S., there hasn't been much monitoring or published data on these structures to understand their performance after wind and seismic events. Understanding the performance of different repaired lateral force resisting systems (shear walls vs moment frames) would be a very beneficial to the practicing engineers working in the concrete repair industry. Though a great deal of data is being collected after the recent earthquake events (such as Chile and Mexico,) it is unknown how corrosion related damage was a contributing factor in damage sustained in recent earthquake events. Furthermore, it is unknown if special precautions should be taken when repairing corrosion related damage in components of lateral load resisting systems (especially moment framed buildings located in hurricane and seismic zones).

To sum, concrete repair technology is still evolving and we are seeing exciting developments in the methods and materials used concrete repairs; however, a great deal of research is still needed to address some of the commonly encountered issues. Also, newly developed materials should be better explained to industry professionals to promote their use. With collaboration of the industry and academia, a lot of the unknowns in the concrete repair industry were addressed and a number of great publications are available to the engineers, but there is still room for research. *Murat Seyidoglu, P.E., S.E.*

& Kaveh Afshinnia, Ph.D.





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2021 ICRI Baltimore-Washington Chapter Spring Golf Outing Thursday May 6th, 2021

With 2021 providing continued challenges for meeting indoors, the local B-W Board brainstormed different ways to get our members together this year for an in-person gathering. It didn't take long to decide that hosting a spring golf tournament would be the perfect venue to achieve just that. This additional ICRI B-W Chapter Golf Outing was held on Thursday May 6th, 2021 at Westfields Golf Club in Clifton VA. The course was in beautiful shape and was a nice change of pace geographically speaking from our annual fall golf outing held further north. It was great to see so many familiar faces, and that was backed up by our tee sheet, which had 106 golfers signed up! A quick morning continental breakfast and snacks on the course hopefully held everyone over before boxed lunches were served post-round. The awards presentation and some words from our Chapter President wrapped up the day, in which many of us got our first sun burn of the year.

Keep an eye out for info regarding the Fall Golf Tournament, which will still be hosted later

this year.

The Chapter appreciates all the golfers who joined us for the day, and we are thankful for the continued support of our sponsors:

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ICRI BW Chapter Scholarship Program APPLICATIONS NOW AVAILABLE AT WWW.ICRIBWCHAPTER.ORG/SCHOLARSHIPS

Each year, the chapter offers both an academic and industry scholarship to qualified individuals. Criteria and eligibility rules and applications can be found on our web site under the heading **SCHOLARSHIPS AND AWARDS**.

CONTINUING EDUCATION SCHOLARSHIP PROGRAM GUIDELINES AND APPLICATION 2020 (ACADEMIC)

Each scholarship granted under this program may be up to \$1,000.00, plus a one year individual membership in the National ICRI and the Baltimore Washington Chapter of ICRI. The award shall be for one year. Applicants may reapply for subsequent years. The Scholarship Award may be used towards an accredited institution of higher learning, professional certification program or a continuing educational program. The winner will have to submit an accountability of the Scholarship Award.

CONTINUING EDUCATION SCHOLARSHIP PROGRAM GUIDELINES AND APPLICATION 2020 (INDUSTRY)

Each scholarship granted under this program may be up to \$1,000.00. The award shall be for one year. Applicants may reapply for subsequent years. The Scholarship Award may be used towards an accredited institution of higher learning, professional certification program or a continuing educational program. The winner will have to submit an accountability of the Scholarship Award.

Questions: Dominic Huey: dhuey@structural.net or call at 443-293-6395



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