

THE NEWSLETTER OF THE BALTIMORE WASHINGTON DC CHAPTER OF ICRI

2ND QUARTER 2022

UPCOMING EVENTS:

MAY 12, 2022
2ND QUARTER
DINNER MEETING
PINSTRIPES BISTRO
& BOWLING

JUNE 17, 2022

CALL FOR OUTSTANDING
PROJECT APPLICATIONS



THE AGGREGATE

- PRESIDENT'S MESSAGE
- , ICRI NATIONAL RECAP
- , MAY DINNER MEETING

MESSAGE FROM OUR PRESIDENT

JUSTIN P. LONG, PE, RWC, REWC, BECXP - SK&A | STRUCTURAL ENGINEERS



It's hard to imagine that we are already into the 2nd Quarter of the year. A lot has transpired between our first dinner meeting and now, and I know from talking to so many of you that a lot of big projects have been undertaken and the workload is starting to pile up. This is always a good problem to have – but ensure that you are taking time to recharge and to enjoy life & family/friends outside of the daily grind.

Your Board of Directors have been very busy so far this year. I am happy to report that our Industry Outreach Committee – Chaired by **Alexander Gugliotta**, is keeping the ball rolling with Morgan State University and the prospect of a student chapter being established this

year is looking solid. There are also discussions about supporting next year's concrete canoe competition team, so be on the lookout for ways you or your company can get involved if you are interested.

We are also excited to have Morgan State's **Mehdi Shokouhian** presenting at our 2nd Quarter Dinner meeting. The dinner meeting will be held at Pinstripes in Bethesda with an earlier start than normal to allow those who want to bowl plenty of time to unwind and reconnect with colleagues before dinner. Big thanks to **Tom Ouska** and **Joe Wilcher** for putting together that program & venue.

As previously announced, we are thrilled to also introduce our new **Concrete Repair Tradesman Recognition Award** in addition to our annual Scholarship & Industry Awards. Please take time to nominate a superintendent, foreman, technician, laborer, or apprentice who has made a huge impact on our industry and others so they can be recognized. A big thank you to **Dominic Huey** – Chair of the Education & Scholarship Committee for taking this idea and making it possible.

Last, but certainly not least, we hosted the Spring 2022 Convention right here in Baltimore, MD! This convention was jam-packed with technical seminars, committee meetings, exhibitors, and recognizing those who have contributed so much to our organization. It was so great to see so many Baltimore-Washington Chapter members in attendance as well as fellow colleagues from as far away as Canada! The two social events we hosted were a huge success and could not have been possible without our Vice President Luke Valentine who made it all happen. A major thank you to him, Rich Barret (Region 3 Representative), and the ICRI National staff for making the convention such a success. I look forward to seeing everyone again in Atlanta this Fall!

Please continue to monitor our website (www.icribwchapter.org) on a regular basis for new postings and information. We will continue to actively update our calendar of events and website to keep our members informed of upcoming events and calls for action.

I am looking forward to seeing everyone at our May 2nd Quarter Dinner meeting. Please feel free to contact me personally at justinl@skaengineers.com with any feedback, comments, or questions you have.

VISIT US AT: ICRIBWCHAPTER.ORG

Justin

2ND QUARTER 2022 LEGAL COLUMN

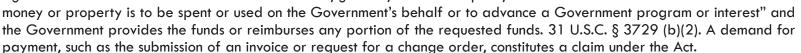
The False Claims Act – A Costly Trap for the Unwary

By Jennifer Mahar, Esquire

Searching for business opportunities in a difficult construction market, contractors and suppliers, who in the past focused primarily on the private commercial sector, are now looking to the Federal sector. If you are among those seeking to do business with the Federal Government, you must realize that the rules of engagement are different from the private commercial sector due to the complex statutory and regulatory landscape. Violating just one of these Federal statutes or regulations can have serious business consequences.

Take for example. The False Claims Act was enacted to protect the Federal Government and its funds from fraud. The Act prohibits, among other conduct, the knowing presentment or causing to be presented a false or fraudulent claim for payment or approval directly to the Federal Government or indirectly to the Federal Government by way of a recipient of federal funds. See 31 U.S.C. § 3729(a). If federal funds are in play on the project, either through the project owner being a Federal entity or through a Federal grant, than the False Claims Act likely applies.

The Act broadly defines "claim" as "any request or demand, whether under a contract or otherwise, for money or property . . . that is presented to an officer, employee, or agent of the United States or is made to a contractor, grantee, or other recipient, if the



You do not need to have a specific intent to defraud to violate the Act. The Act defines "knowing" as having actual knowledge of the information, acting in deliberate ignorance of the truth or falsity of the information, or acting in reckless disregard of the truth or falsity of the information. See 31 U.S.C. § 3729(b)(1).

The False Claims Act applies equally to general contractors, subcontractors and suppliers. A false claim may be as basic as the submission of an invoice for payment that includes amounts for work not performed, materials not delivered, or defective work that has not been disclosed. It may also be the submission of a pass through claim from a lower-tiered contractor or supplier where the contractor incorporates a false invoice from a lower-tiered contractor or supplier into its payment application.

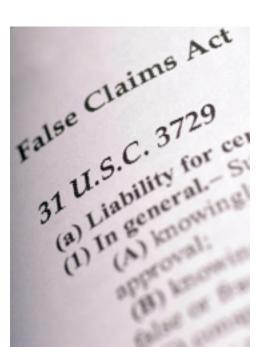
The consequences for violating the False Claims Act can be economically hefty. A violator is subject to a civil penalty between \$5,000 and \$10,000 for each violation plus three times the amount overstated in the false claim. See 31 U.S.C. \$ 3729(a). For example, if a contractor submits three false invoices which overstate the amount due by an aggregate amount of \$15,000, the contractor could face reimbursing the Federal Government \$45,000 in damages (3 x \$15,000), paying civil penalties in the range of \$15,000 to \$30,000 (3 violations at \$5,000 - \$10,000 each), and reimbursing the Federal Government its costs

incurred to prosecute the false claim.

Accordingly, fundamental to succeeding in the Federal sector as a contractor or supplier are an understanding the Federal statutes and regulations which govern, such as the False Claims Act, and the implementation of appropriate processes in your business operations to make sure you comply with these requirements.

For further questions, Jennifer can be reached at 703-847-6300 or jmahar@smithpachter.com.











2022 ICRI SPRING CONVENTION - BALTIMORE, MD - APRIL 4-6, 2022 WEATHER - ITS IMPACT ON CONCRETE AND CONSTRUCTION

The ICRI National Spring Convention was held in our very own Baltimore, Maryland. It was a great event and was heavily attended by members of our local chapter. For those that travelled from all over the country to attend, they got a good taste of Maryland's erratic weather, which is fitting because the theme of the convention was "Weather – It's Impact on Concrete and Construction."

The convention was a first for me in several ways. It was my first time attending an ICRI National Convention, it was my first time attending as a Delegate, and it was my first time helping plan the social events organized by our local chapter. I attended all three days of the Convention and attended nearly all of the Technical Sessions each day, so I won't list them all out now, but thought that there was a good mix of topics for all knowledge/experience levels (i.e., basic information, very technical information, case studies, etc.).

On Tuesday afternoon, I attended the Membership Committee meeting which was perfect timing because a consultant was presenting on the results of a study on how to improve membership. A key takeaway for me was that the Institute is trying to simplify the process of member enrollment and renewals.

On Wednesday, I attended the meeting for Committee 160 – Life-Cycle and Sustainability. There was a lot of great discussion in this meeting, and I was glad to see that the Institute is striving towards making sustainability the normal in our industry, not just a hot-topic. Also on Wednesday, I attended the Inter-Chapter Luncheon followed by the Chapters Committee meeting. Both the luncheon and meeting were a great way to hear about other chapters' strategies for bouncing back from COVID-19.

In addition to the technical sessions and meetings, I was able to network with fellow members in the Exhibitor's Hall, at the Welcome Reception, and at both of the social events at Mustang Alley's and Rye Street Tavern. For me, this was the best part of the Convention; getting to catch up with peers, colleagues, and fellow members to talk shop, or just talk about how things are going.

Based on my experience as a first-timer, I would definitely attend another conference and recommend others to attend, as well. Thank you for the opportunity to attend as the Delegate for our chapter!

AGGREGATE WRITE-UP BY LUKE C. VALENTINE. P.E.





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ICRI Baltimore Washington Chapter 2nd Quarter Dinner Meeting



Thursday, May 12, 2022

PINSTRIPES 11920 GRAND PARK AVENUE NORTH BETHESDA, MD 20852

SCHEDULE:

5:00 pm Social Hour & Bowling 6:00 pm Dinner 7:00 pm Presentation

REGISTRATION:

\$80 for Members No Bowling \$95 for Members with Bowling \$90 for Non-Members No Bowling \$105 for Non-Members with Bowling

REGISTRATION DEADLINE IS MAY 6, 2022

Company:	
Name:	
E-mail:	Phone:
Number of Attendees: Attendee Names:	

The dinner meeting program will include presentations on data from two separate experimental investigations:

- 1) Residual Strength of Partially Confined Retrofitted Concrete Column Using CFRP Wrap
 This research presents experimental investigation to assess the residual compressive strength of CFRP wrapped 1/6-scale concrete columns to enhance confinement.
- 2) Investigation of Bond Strength of AFRP Bars with Self-Consolidating Concrete
 This investigation aims to study the effect of varying superplasticizer dosage and water-to-cement ratio (w/c) on the bond strength between aramid fiber reinforced polymers (AFRPs) bar and self-consolidating concrete (SCC).



Presenter: Dr. Medhi Shokouhian

Dr. Shokouhian is an Assistant Professor at the Department of Civil Engineering, Morgan State University. He earned his Ph.D. in structural engineering from Tsinghua University in 2015. He conducts integrated experimental and analytical research on innovative structures and high performance materials. Dr. Shokouhian has been principal and co-principal investigator on many projects funded by federal and state agencies exceeding \$1.2M. He published more than 60 peer-reviewed journal articles, conference proceedings papers, and technical reports. He has served as editorial board member and reviewer for more than 15 international and national refereed journals. He is an educator member of American Institute of Steel Construction (AISC) and American Concrete Institute (ACI), and an active member of American Society of Civil Engineers (ASCE).

Scan and email this completed form to Chapter Secretary, Todd Carroll by May 6th. Checks may be mailed with your form or you can bring them with you to the meeting. **Todd Carroll**

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AVOIDING CONCRETE TOWER FAILURE ON A BUDGET

ICRI BALTIMORE

By **D. Kipp Gaynor, P.E.** & Bahareh Forouzan, Ph.D.



Figure 1 – West wing – south elevation.

Recurring repairs led the Owner to commission a study to evaluate the repetitive tower column deterioration. A survey and analysis were performed to determine if the columns that support the twelve-story residential structure required repair or replacement to avoid rupture or partial collapse (see Figure 1). The lowest level of the building was a single level below-grade garage which utilized a structural slab supported by caissons. The second level was an elevated plaza deck that accommodated a fire lane, vehicular access, deeded parking as well as a large, landscaped plaza located on one end of the project. Rising from the elevated plaza are cast-in-place concrete columns that extend two stories to the first level of residential units. These tall two-story columns were the subject of the investigation, testing, sampling

and remedial design to stabilize the tower above and to address the recurring cycle of patch/repair that was occurring throughout the columns at the elevated plaza deck.

Evaluation

Based on the severity of the column deterioration and cracking at the base of the tower columns, an investigation was performed to evaluate the condition of the structural columns, the plaza-to-column membrane waterproofing transitions and the drainage/water management system at the plaza deck level.

Concrete column testing and sampling included half-cell corrosion mapping at a selected number of columns, chloride ion testing, and concrete core extraction and testing.

Visual inspections revealed various cracks, concrete spalling, corrosion staining

and severely deteriorated embedded electrical conduits

within the columns. Many spalls were noted to be at previous repair locations.

A finite element analysis was performed to establish the moments, shears as well as axial forces at the base of the plaza level columns (see Figure 2). These values were then used in a worst-case analysis to evaluate the reduced column cross sections based on various concrete spall conditions observed. Numerous iterations of the reduced column cross sections (i.e., those that were anticipated during the column repair) were analyzed. Calculations of the modified moment of inertia and the resulting non-symmetrical center of gravity were used to determine the stresses in the columns from the vertical loads and frame related shears and moments. The effect of variable wind directions on the tower during the repair work were also considered to identify the maximum cross-sectional area of a concrete column that

could be removed at one time.

The results of the analysis were used to establish how much concrete could be removed from the corners of the tower columns without overstressing and

Figure 2 – Finite element made of concrete frame.

or destabilizing the column and tower structure above in a "non-shored" condition. The sequencing and location of the demolition work to maintain stability of the tower structure above was also evaluated. From the analysis, a sequencing protocol was established for the Contractor to perform the column repair work.

Shoring & Sequencing to Control Costs

Due to the extensive concrete deterioration at the two "L" shaped corner columns at the west end of the tower, the columns required replacement (see Figure 3). In order to replace the columns at the plaza level, a complex shoring system needed to be installed. The shoring needed to support the live, dead, and snow loads from the twelve-story tower and also had to deliver the loads into its own independent foundation. The garage below the plaza was designed as a structural slab spanning across unsuitable subsurface conditions. The tower and garage were supported on drilled caissons. Column shoring design considered the feasibility of supporting the shoring on the existing caissons but was ruled out leading to a specialty shoring contractor design that was supported on push piers that were installed through core holes in the garage's structural floor slab (see Figure 4).



Figure 3 – Removal and replacement of "L" shaped column corner tower.



Figure 4 – Push piers below the spreader beam support the shoring system just above the structural garage floor slab.

The push piers were installed against the building's weight, however, proof loading of the shoring foundations to establish a factor of safety was not feasible since the building loads were the only available resistance force. Accordingly, a program was devised to perform creep testing under incremental loading applied to the piers. The testing validated that the piers would not creep under the sustained loading from the tower.

In addition, the shoring inside the tower was designed to be as minimally intrusive to allow the kitchens of the residential units to remain in service (see Figure 5). The Owners' project requirements included maintaining occupancy of the units while the project was ongoing which required that portions of the kitchen cabinetry be removed and stored while the refrigerator remain

in service. The refrigerators had to be relocated to the living room for the duration of the project.

Previous Repair Deficits

Previous repairs involved the removal of the concrete spalls and cleaning of the steel along with form and pour or hand patching. Such repairs would serve to be only short time solutions to a never ceasing cycle of corrosion born from heavily chloride concrete coupled with an endless source of moisture. Repairs also did not address the water source from the reglet located below the pavement surface and the water pathway through the reglet continued to be the means for future spall propagations (see Figure



Figure 6 - Corrosion of the reglet and column corner guard at the plaza level.

spalls repaired, the perimeter of the subject columns were waterproofed with a reinforced hot rubberized asphalt membrane. The membrane was then overlain with a layer of aggregate and surfaced with a bituminous asphalt.

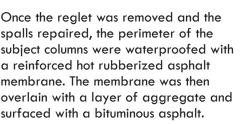


Figure 5 - Shoring layout inside the unit was designed to maintain occupancy and kitchen operations within the units.

Concrete Repair

Column repairs were performed using a form and pump technique using selfconsolidating repair materials (see Figure 7). Pressure was held by pump pressure and applied to the repair area to help reduce curing shrinkage. ICRI repair standards were used for steel preparation and concrete profiling.

Original Design Deficits The original 1960's architectural design

provided for reglets to terminate the membrane waterproofing at the base of the columns. The unfortunate part of their best of intentions resulted in a pathway for the salt laden water (trapped in the plaza's asphalt surfacing) to reach the primary column reinforcing. The plaza design lacked a strategy to efficiently deliver water at the membrane level to the parking deck drains. Two tier/bi-level drainage were not considered, and the surface water penetrated the pavement and collected above the membrane with no means to efficiently flow to the plaza drains.

The winter weather of the mid-Atlantic region further exacerbated the column base deterioration by presenting a salt brine from deicing agents that were drawn into the concrete columns at the reglet elevation. Once the concrete was able to absorb the chloride laden water from the surrounding environment, the die was cast for the recurring future repairs.



Figure 7 - Form and pump technique was utilized to minimize shrinkage cracking.

Cathodic Protection

6).

Due to the high chloride levels and half-cell corrosion potential testing results obtained as part of the study (see Figure 8), a targeted strategy to implement a passive cathodic protection was developed. A passive cathodic protection system was tailored to address regions of the columns where corrosion potential was indicated. This led to different treatments at different columns to reconcile their condition. Given that the passive system would require some level of monitoring over time, the Owner agreed to the additional cost of installing monitoring junction boxes at four locations to allow for periodic connection and system function verification.

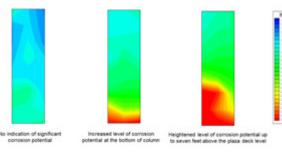


Figure 8 - Half-cell corrosion potential testing.

Conclusion

The tower column rehabilitation was very challenging and required the participation and collaboration of several experts to devise a means to affect long lasting repairs that were cost-effective and sensitive to the Owners' project requirements as well as responsive to a myriad of technical and logistical issues. The project engaged the building management team, geotechnical engineering consultants, a specialty shoring design contractor, experts in concrete corrosion mitigation, a specialty manufacturer of corrosion mitigation systems not to mention a structural engineer who spearheaded the rehabilitation planning. Each party was tasked with optimizing their creative design solutions to minimize rehabilitation costs while producing long lasting repairs that resulted in a stable

tower and structurally responsive remedial strategy that addressed the original design deficits as well as re-set the maintenance cycle for the critical tower columns.

The sequencing of the column repairs provided the Owner with a means to effect repairs without the astronomical cost of shoring each of the forty-seven deteriorated tower columns. The shoring work for the "L" shaped corner columns approached \$450,000 which posed a significant financial burden to the association.

Careful, big picture planning and sensitivity to cost efficient repairs over a conservative shoring strategy paved the way to a rehabilitation that saved the life of the structure and provided a cost practical way to repair the building in service with limited disruption to the residents.

The achieved results include a greatly extended service life as well as reduced future maintenance costs of the columns by addressing the cause of the spalling. The rehabilitation work addressed the chloride induced corrosion through a passive cathodic protection system that allows for monitoring and validation on a periodic basis to keep the columns protected now and in the future.

By D. Kipp Gaynor, P.E. & Bahareh Forouzan, Ph.D.

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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.

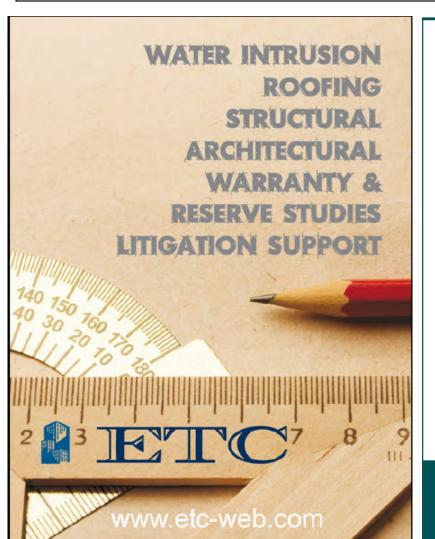
CONTINUING EDUCATION SCHOLARSHIP PROGRAM GUIDELINES AND APPLICATION 2020 (INDUSTRY)

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.

CONCRETE REPAIR TRADESMAN RECOGNITION AWARD PROGRAM

The first place Concrete Repair Tradesman Recognition Award entry granted under this program will receive a \$500.00 award that can be used for the purchase of new tools/equipment or for continuing education, training, or other industry certification. The first-place award will also receive a complimentary one-year individual membership in the Baltimore Washington Chapter of ICRI. The second and third place Concrete Repair Tradesman Recognition Award entries granted under this program will each receive a \$250.00 award that can be used for the purchase of new tools/equipment or for continuing education, training, or other industry certification

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





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2022 CHAPTER CALENDAR

- May 12, 2022 2ND QUARTER DINNER MEETING PINSTRIPES
- June 17, 2022 -CALL FOR OUTSTANDING PROJECT APPLICATIONS
- July 2022 CHAPTER SOCIAL EVENT TBD
- August 10, 2022 ICRI-BWC BOARD MEETING SK&A OFFICE
- September 8, 2022 3RD QUARTER DINNER MEETING -MAGGIANO'S LITTLE ITALY
- September 16, 2022 OUTSTANDING PROJECT SUBMISSIONS DUE
- September 16, 2022 -SCHOLARSHIP APPLICATIONS DUE
- September 26, 2022 -2023 BOARD OF DIRECTORS NOMINATIONS PUBLISHED
- October 6, 2022 -ANNUAL GOLF TOURNAMENT WAVERLY
 WOODS
- October 1, 2022 -ICRI NATIONAL 2022 FALL CONVENTION ATLANTA, GA
- November 10, 2022 ANNUAL MEMBERS MEETING &
 OUTSTANDING REPAIR PROJECT 2022 AWARDS BANQUET -
- December 8, 2022 -2022 FALL TECHNICAL SEMINAR CP&R'S MAIN OFFICE







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