

THE BALTIMORE WASHINGTON DC **CHAPTER OF ICRI**

2ND QUARTER 2020

CHAPTER CALENDAR

Chapter Scholarship **Application Available** April 9, 2020

2nd Quarter Chapter Dinner Meeting May 14, 2020 (TENTATIVE)

Call for Outstanding Project **Applications** June 3, 2020

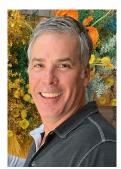
THE NEWSLETTER OF



- PRESIDENT'S MESSAGE
- STAY AT HOME TRAVEL GUIDELINES
- JOINT DINNER RECAP

MESSAGE FROM OUR PRESIDENT

RICH BARRETT - LYMTAL INTERNATIONAL, INC



I hope my message finds you and all your loved ones safe and sound during this unprecedented global crisis. We all are enduring our quarantined situations as our Federal, State and Local governments work diligently with the medical and scientific community to develop a cure for the COVID-19 virus. They are also looking out for our better good and implementing restrictions on each and every one of us while dealing with this Pandemic. I hope we all can do our part to minimize the spread of this virus by listening and following the mandates enacted.

As you may be aware, our line of business largely falls under the essential business in the Commercial and Residential Construction Industry. This allows us to keep working on current and upcoming projects (see the Legal Article pertaining to right to travel for construction work). Please be safe everyone and make smart decisions as we are out on our projects.

The Scholarship Application is available for college students. If you know of anyone in the Engineering field of studies please spread the word. They can contact Dominic Huey who is the chair of the Education and Scholarship Committee at dhuey@structural.net.

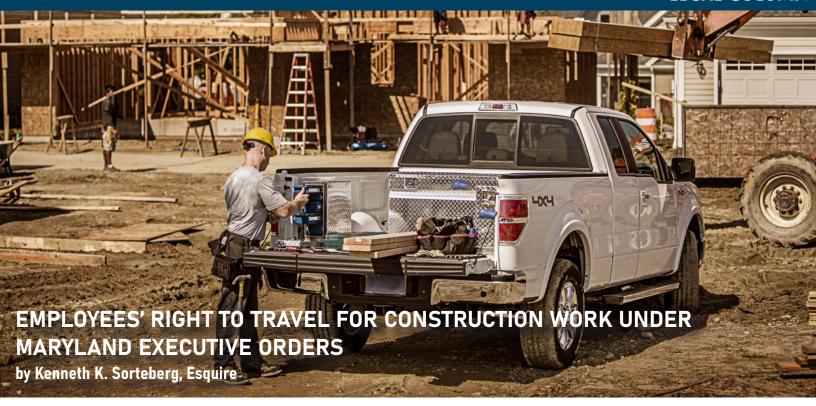
The 2nd Quarter Dinner Meeting will be held at The Hotel at College Park. Hopefully I and the ICRI Baltimore Washington Officers and Directors will see you there. We will continue to monitor the status of where we are at with the COVID-19 Pandemic accordingly. If we find it necessary to cancel, we will do so at a later date.

We are doing what we can to keep things moving forward at the ICRI Chapter level and are here to help you if you need it. Times like these show the strength, character and importance of an association like ICRI. I am so proud to represent this great organization as your Chapter President, and I wish to thank each and every one of you for your continued dedication, engagement, and support!

For now, I wish you and your family safety and health as we continue to weather these unprecedented circumstances.

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

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On the one hand, the State of Maryland's March 30, 2020 Executive Order imposes a "Stay at Home" order on Maryland residents and a 14-day quarantine requirement on out of state travelers. On the other hand, the State of Maryland's March 23, 2020 Executive Order permits residential and commercial construction companies to continue to operate. Employees of construction companies have rightfully expressed concern over



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their ability to leave their homes for work and also to commute in and out of Maryland in order to work on construction projects.

To address these concerns head on, the State of Maryland Office of Legal Counsel has issued a March 30, 2020 Interpretive guidance which states as follows at Section 1 and Section 2:

- 1. Employer Documentation. Employers who are permitted to remain open (to any degree) under the Order may wish to provide a letter to employees who must commute to and from work. This will help employees establish their need to travel if challenged. The suggested content for the letter is:
 - a. the name and address of the employee;
 - b. the name and address of the employer;
 - c. the nature of the employee's work;
 - d. a brief statement of why the employer remains open for business; and
 - e. a signature and contact information for the employer.

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- 2. Commuters To/From Adjacent States, and Persons Transiting Maryland. In connection with the announcement of the Order, Governor Hogan stated that persons traveling into Maryland from anywhere outside Maryland are required to self-quarantine for 14 days. This is not expected of:
 - a. persons who regularly commute into Maryland from an adjacent state or the District of Columbia, or vice-versa, unless such persons should otherwise self-quarantine under applicable CDC or MDH guidance (for example, because of recent travel to the New York/Tri-State area);
 - b. persons transiting through Maryland who have only minimal contact with Maryland, i.e., only stopping for fuel, food, or other necessary supplies, not making contact with anyone for more than three minutes at a distance of less than six feet.

Please feel free to contact Ken Sorteberg at 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.

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THEAGGREGATE



CEMENT SOLIDIFICATION IN SPACE

Juliana Neves, Ph.D.
Project Engineer
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The moon has been visited by humans multiple times, the last being in 1972, during the Apollo 17 mission. Plans to colonize the moon received greater attention after a significant amount of water was detected inside moon craters by the American satellite LCROSS, in 2009. Nearly 50 years later, the next crewed mission to the moon is a planned flyby in 2021 during NASA's Exploration Mission 2 (EM-2). A permanent return to the moon and the construction of a lunar space station as a base to take humanity further "to Mars" has been proposed in Space Policy Directive 1 and by NASA's Artemis program. One of Artemis' goals is landing the first woman and the next man on the moon by the year of 2024 and later expand the human presence beyond Earth. To achieve such a goal, it is a prerequisite understanding how reduced gravity levels affect the human body and life, since the gravities on the moon and Mars are significantly lower than Earth's.

Creating a reduced-gravity environment on Earth is not an easy task, although parabolic flights can provide a short stint of reduced gravity. Most research requires more than a few seconds of low gravity for experiments to be performed, which motivated the construction and operation of the International Space Station (ISS). The ISS is a habitable artificial satellite orbiting from an altitude between 330-435 km above the sea level, where the gravity force is minimized to 10-6g and is referred as microgravity (µg). One of the main purposes of the ISS is to serve as a research laboratory, and recently a study was performed on the hydration of cement in microgravity. The results of this study can help understand how concrete construction and repair may differ from procedures on Earth; and ultimately it can be a step towards the fabrication of dwellings and infrastructure outside of Earth.

The study discussed below is known as the Microgravity Investigation of Cement Solidification (MICS) research project, in which cement hydration was conducted aboard the ISS. The hypothesis is that eliminating gravity-driven transport phenomena, such as buoyancy and sedimentation, ensures considerably different conditions from those on Earth. This variation in materials processing results in changes in the microstructure and, consequently, lead to changes in the properties of the cement paste.

Due to the high cost of sending cargo into space and the strict safety requirements on the ISS, rather than casting typical concrete cylinders, the astronauts mixed small cement paste specimens that could hydrate within sealed plastic bags while aboard the ISS. Over a hundred specimens were hydrated under microgravity and then returned to Earth through

a splashdown. For each sample mixed and hydrated in space, an identical replicate was simultaneously mixed and hydrated at Penn State University for comparison. Both space and Earth specimens remained sealed, and at the same temperature, humidity, and pressure until the microstructural analysis was conducted on Earth.

The analysis consisted of using materials characterization techniques to report and quantify any changes in the microstructure led by microgravity. All the samples had a great amount of trapped air intermixed with the cement paste due to lack of buoyancy, as shown in Figure 1.

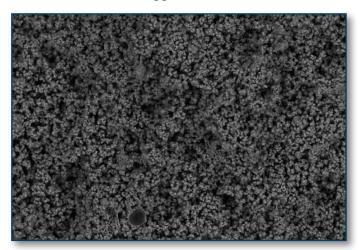
Scanning electron microscopy (SEM) enabled powerful visual observations of the microstructure and showed that mixtures proportions with high water-to-cement ratio (w/c of 2.0 by mass) were the most affected by gravity and for lack of it.



Figure 1: Cement paste hydrated in microgravity showing entrapped air within the cement matrix.

CEMENT SOLIDIFICATION IN SPACE - CONTINUED

Figure 2 shows the microstructure of Earth-gravity (1g) and microgravity (µg) high w/c pastes. The microstructure of the Earth gravity sample seems denser, whereas that hydrated in microgravity is sparser. The microgravity sample presents a significant amount of entrapped air bubbles, which are the shell-like structures in Figure 2.



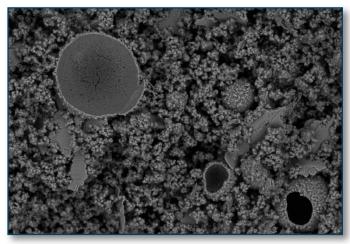


Figure 2:The microstructure of portland cement paste, w/c 2.0. The SEM images were taken from the cross section of 1g and μ g specimens. The shell-like structure are trapped air bubbles in the μ g image. Scale bar of 100 μ m on each image.

Apart from the air bubbles, the porosity, or spacing between the cement crystals, is affected by microgravity due to higher effective w/c and by lack of self-consolidation, as shown in Figure 2. Our results show that the percentage of pores can increase up to 75% with minimized the gravity force, depending on the w/c. Higher porosity and larger pores in microgravity result in a cement paste with lower density. Since the load-bearing capacity, durability, and cost-efficiency of a concrete structures greatly depends on cement's microstructure, one should expect that a more porous cement is likely to perform poorer than a denser cement.

This research can also be used to highlight the importance of selecting a suitable concrete mixture design for repair applications. Although adding water can facilitate placing of fresh concrete, the excess water is harmful to the hardened concrete and leads to excess porosity in both Earth and space setting. On Earth, the excess water also causes the cement paste to bleed, as shown in Figure 3. The bleeding process lead to the formation of layers that have different properties. The layered cement paste seems highly susceptible to cracking and spalling.

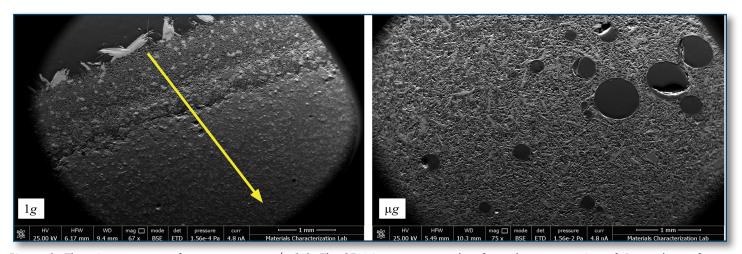


Figure 3: The microstructure of cement paste, w/c 2.0. The SEM images were taken from the cross section of 1g and µg after polishing samples. The 1g sample shows bleeding / layering, whereas the space sample (µg) shows higher porosity and entrapped air bubbles. The arrow points towards the direction of terrestrial gravity.

Lastly, this research underlines the importance of fully understanding the transformation of materials from fresh to harden state. It is crucial that the environment is also considered prior to the selection and use of construction and repair materials. Even if identical repair procedures are followed, the adequacy of the material selection can have a tremendous impact on the performance and durability of the final structure.

ICRI BALTIMORE WASHINGTON 1st QUARTER DINNER MEETING Joint Dinner Meeting with ACI

by Brian Radigan | Tremco









Members of the local chapters of ICRI and ACI convened together for the 1st Quarter Dinner on February 13th. The first meeting for 2020 was hosted at Maggiano's at Tyson's Corner in McLean, VA. A very special thanks to Brian Baker (PPSI) and the Facilities Committee for setting up the event at one of the chapter's favorite locations. A crowd of over 80 people was in attendance with old and new members alike. Conversation between old friends and new continued into the main dining hall where a delightful spread was provided prior to the start of the night's technical seminar.

Chapter President, Rich Barrett provided a recap of the Board's activities along with information regarding upcoming events for the association. In regard to ICRI business, Rich placed a call to the crowd for technical articles for inclusion into the Aggregate. He also called on members to participate in a survey for ideas on an additional social event for the year.

For the evening's technical seminar, Michael Carmada from Smislova, Kehnemui & Associates presented on the winning project for the Outstanding Building of Year Award, The Watergate Office Building. The presentation highlighted the many challenges faced by the project team on this rehab which required concrete repairs of all types. The scope was amplified in difficulty by the tough logistics of downtown Washington DC and coordination between neighboring properties.

It was a great start to the year! Thanks to all who attended!





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Thursday, May 14th, 2020

THE HOTEL AT THE UNIVERSITY OF MARYLAND 7777 BALTIMORE AVE
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THE 2ND QUARTER DINNER MEETING
REMAINS IN TENTATIVE STATUS AND THE
BOARD WILL COMMUNICATE UPDATES VIA
EMAIL AND OUR CHAPTER WEBSITE.

2020 CHAPTER DATES

MAY 14, 2020 -2ND QUARTER DINNER MEETING - HOTEL AT COLLEGE PARK, MD

JUNE 3, 2020 -CALL FOR OUTSTANDING PROJECT APPLICATIONS

AUGUST 13, 2020 -ICRI-BWC BOARD MEETING – RAMS HEAD @ SAVAGE MILL, MD

SEPTEMBER 10, 2020 -3RD QUARTER DINNER MEETING MAGGIANO'S LITTLE ITALY – TYSON'S CORNER, VA

SEPTEMBER 18, 2020 -OUTSTANDING PROJECT SUBMISSIONS DUE

SEPTEMBER 18, 2020 -SCHOLARSHIP APPLICATIONS DUE

OCTOBER 1, 2020 -2020 ANNUAL GOLF TOURNAMENT – TIMBERS @ TROY

OCTOBER 5-7, 2020 -ICRI NATIONAL 2020 FALL CONVENTION – MINNEAPOLIS, MN

NOVEMBER 5, 2020 -OUTSTANDING REPAIR PROJECT 2020 AWARDS BANQUET HOTEL AT COLLEGE PARK, MD

DECEMBER 3, 2020 -2020 FALL TECHNICAL SEMINAR - CP&R'S MAIN OFFICE



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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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THE BALTIMORE/WASHINGTON D.C. CHAPTER OF ICRI IS SEEKING TECHNICAL ARTICLES FOR PUBLICATION IN ITS QUARTERLY NEWSLETTER, THE AGGREGATE.

The Aggregate is the official newsletter for The Baltimore/Washington, DC Chapter of The International Concrete Repair Institute and is published quarterly and sent to tall current sustaining members of the chapter. In addition to chapter news, highlights, and possible advertising opportunities, The Aggregate includes informative technical articles on a variety of issues related to the concrete repair industry.

The ICRI BWC chapter is looking for individuals interested in contributing a technical article (s) related to industry practice or instruction, technology and design, professional concepts/issues, project profiles, or any other topics relevant to ICRI members. Articles will be presented as the main article in an upcoming edition of The Aggregate. Articles do not necessarily need to be authored by an ICRI member, so please forward this request to any individual outside of the organization who may be interested in submitting. This could be a great opportunity for younger professions to get published or for someone to share an informative or interesting lesson learned article. Please visit the Aggregate archives on the ICRI-BWC website to see the types of articles that have been published previously.

Also, technical article contributors to the Aggregate will recieve a complimentary registration for the succeeding quarterly dinner meeting for ICRI BWC.

Please contact Rich Barrett (<u>rich@lymtal.com</u>), Chapter President for more details.





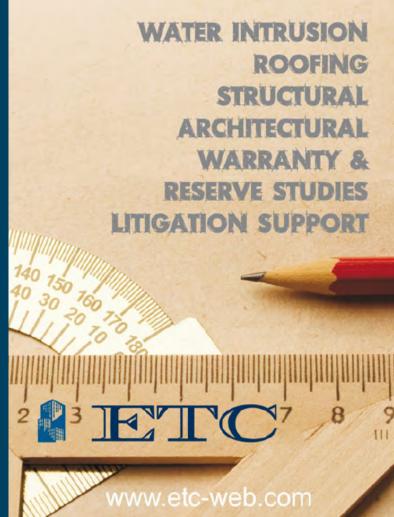
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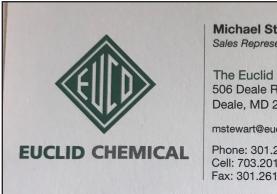
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