



THE STRUCTURAL ENGINEER

ASR and DEF Cracking. "It is not as bad as it seems"

Concrete columns that are part of any structure exposed to moisture (i.e. bridge and parking structure perimeter columns) present a seemingly ugly picture when subjected to apparently severe cracking due to internal expansive forces from alkali-silica reaction (ASR) and delayed ettringite formation (DEF). Based on the presenter's experience, and supplemented by several independent research studies, the apparently severe cracking in concrete elements subject to expansion forces from either ASR or DEF, or both, is often not as detrimental to the structural integrity of the column elements as it seems. The distress caused by internal expansion forces resulting from ASR and DEF primarily affects the concrete cover, but the core of the concrete columns confined by mild steel reinforcement is generally not significantly compromised.

This presentation will discuss the cracking mechanism in concrete columns caused by ASR/DEF, present an introduction to a comprehensive approach to investigating this type of cracking, and describe a proven repair and monitoring program. The comprehensive approach to evaluate the significance of the cracking on existing precast concrete columns consists of up-close field observations, non-destructive testing, material sampling, inspection openings, petrographic studies, structural analysis, and reporting.

The presenter will discuss a repair program for column elements that are deemed to be structurally adequate, which consists of surface preparation, sealing cracks with flexible sealant, application of a clear sealer, and application of a silicone based paint system. The general goal of the repair approach is to maintain the relative humidity in the concrete column below the threshold that triggers the ASR and/or DEF mechanisms. The presenter will also discuss one or two case studies.

WHEN:	WHERE:	MEETING INFO COST:	RSVP:	UPCOMING MEETINGS
June 15, 2017 6:00 pm Social 6:30 pm Dinner 7:00 pm Program	Hess Engineering and Scientific Society 5430 Westheimer Houston, TX 77056 (713)627-2283	Members: \$25.00 Non-members: \$35.00 Student members & Non dinner guests \$10.00	Click Here to register online. The deadline is 12:00pm, the Tuesday before	Summer Break TBD September 21, 2017 TBD

[CLICK HERE](#) TO REGISTER FOR THIS MEETING

Presenter's Bio

Alfredo E. Bustamante



Mr. Alfredo E. (Al) Bustamante is a Principal and the Director of Restoration of Walker's Mid-South region. He is a registered Professional Engineer in Texas and Louisiana. He received his Bachelor of Science in Civil Engineering from Old Dominion University in Norfolk, VA and Master of Science in engineering with an emphasis on structural engineering from the University of Illinois at Urbana-Champaign, Illinois.

Mr. Bustamante has over sixteen years of experience as a project manager for a variety of projects related to structural, architectural, and material distress. His experience includes the evaluation, design, and construction phase services of many precast concrete parking structures.

Mr. Bustamante is a past President of the Houston/ Gulf Coast Chapter of SEAoT, the current Chair of the FPA SC-13 - Evaluation Methods for Existing Foundations (2007-2010), a member of the International Concrete Repair Institute (ICRI), the American Concrete Institute (ACI), the American Society of Civil Engineers (ASCE), The National Society of Professional Engineers (NSPE), the National Academy of Forensic Engineers (NAFE), and the American Institute of Steel Construction (AISC).

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President's Corner

Rick Miles, PE

Welcome to the June newsletter! Here at the midpoint of the year, I'd like to give an update on chapter happenings and set some goals for the remainder of the year. Of course, after the June meeting we will be 2/3s through our evening meeting slate for the year so time continues to fly.

One thing I am proud of is that we have increased our meeting attendance significantly in 2017. Our average meeting attendance is just over 23 for the first 5 meetings of the year. Over the last two years, I had watched our attendance trickle downward so I am glad to have helped reverse the trend. I am hoping that we can keep the momentum going, and I still view our sweet spot goal for meeting attendance in the mid 30s.

This is important for several reasons:

- A higher meeting attendance results in a more vibrant atmosphere that encourages people to return and participate.
- A higher meeting attendance makes our chapter more attractive for potential speakers and sponsors.
- Financially, a higher meeting attendance reduces the average cost-per-person. At lower attendance rates the chapter can actually lose money on a monthly meeting.

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President's Corner (continued)

Rick Miles, PE

I would like to thank you for your participation to date, and if you haven't been out to a meeting please come out and join us. I think we've got some good momentum going and see it continuing if we commit to maintaining our communication efforts.

Now that our meeting attendance is on the right track, I'd like to renew focus on the following areas:

Young engineers events – involvement of the younger engineers is critical for growing our membership base.

Student Chapter engagement – primarily by reviving our scholarship program, I think the chapter needs to serve as a resource for local engineering programs. The mentoring and networking aspect should be attractive to civil engineering students and we should serve as stewards of our profession.

PDH requirements – currently, the chapter provides 9 PDHs a year through our 9 monthly meetings. I would like to increase this to make the required 15 hours available to our members on an annual basis. My thoughts on how to accomplish this?

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- Coordinate two one-hour lunch and I learns during the summer months. These would be vendor driven, and occur at a restaurant during the summer months. The goal would be for these to be free for our members (paid for by the sponsors)
- Coordinate one half-day seminar a year - something like this would probably include a lunch and would be provided based on interest and at an additional cost to our members. Something like this would probably be more technical in nature, and I would like to hear from you if you are interested in such an event.



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President's Corner

Rick Miles, PE

At the June meeting, I'll speak more about these efforts and hopefully have some information regarding some potential summer lunch and learns. I'm also planning to send out some brief online surveys to get your thoughts these topics.

Moving forward, we will need some additional volunteers. I've spoken with a few of you about volunteer opportunities and they will be available shortly. I think that with a few additional folks, we can further delegate our chapter goals and responsibilities such that these needs can be met with little individual effort.

Thanks for reading, and I'll see you at the June meeting!



Rick Miles, PE
RMiles@walterpmoore.com

Secretary's Corner

Dan Barbuto, PE

We are halfway through the year and it's been a good year so far. Our June meeting will be the last meeting before our normal summer recess. There are no meetings scheduled in July and August. We will resume our meetings in September. This summer we are considering a summer lunch and learn with HILTI and a possible Woodworks day-trip event to tour a lumber mill facility. Stay tuned for up-coming events. President Rick promises "great things to come."

In May, we had a great turnout. Jacob L. Borgerson, Ph.D., P.E., a consultant with Paradigm Consultants, Inc, presented "Concrete Construction Problems: Challenges Faced by the Structural Engineer." Jacob discussed concrete construction issues such as mass concrete, concrete cracking, concrete strength testing, among other issues.

2017 Officers and Directors

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