THE AGGREGATE

International Concrete Repair Institute Baltimore Washington Chapter, Inc.
www.icribwchapter.org

2nd Quarter 2011

IN THIS ISSUE

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ANCHORED VENEER- HOW GOOD IS YOUR FASTENER?

Part 1

By: S.H.Getz, BSCE

Brick veneer/ cavity wall construction is a popular building practice. The aesthetic value, quality image, and the constructability of brick veneers lends to its diverse application. The advantages associated with the use of brick veneer are numerous and that discussion will be left for further evaluation at another time. However, the air barrier integrity of the veneer system has become a significant entity in the design and construction of brick veneered structures. An area of interest amongst design professionals and building owners is the awareness of energy savings and LEED recognition associated with the masonry. The design team and contractor are expected to construct the brick veneer maintaining focus on the essentials of air barrier integrity and moisture control. An improper brick tie and fastener combination can lead to unexpected compromises in the veneer stiffness and potential moisture and air leakage issues.

Brick ties have been developed to comply with a stiffness criterion of 2,000 lbs per inch, which becomes a critical standard as the veneer reacts to wind blown pressure and the wall tie systems ability transfer the live load to the parent structure – with minimal veneer deflection. Insufficient and inadequate ties and fasteners can exacerbate the wall deflection and allow for deficiencies in the performance based expectations of the veneer for water tightness and air permeability. The unexpected weakness of the tie configuration can be the fastener used

see Fastener - page 4

CHAPTER MEETINGS

2nd Quarter Dinner Meeting

May 5, 2011
Holiday Inn, College Park, MD

ASSESSMENT OF EXISTING STRUCTURES IN THE ABSENCE OF DRAWINGS

By Keith Kesner, Ph.D., P.E., S.E., Associate, WDP & Associates, P.C.

COME EAT, DRINK AND BE MERRY!

see page 3

1st Quarter Dinner Meeting

The February 2011 Program of the *ACI-National Capital Chapter & ICRI-Baltimore Washington* Chapter Joint Meeting included a lively presentation by engineer Ronaldo "Nick" Nicholson, P.E. (Chief Engineer for DDOT) on the ***"USE OF CONCRETE FOR DESIGN SOLUTIONS ON THE RECONSTRUCTION OF THE WOODROW WILSON BRIDGE."***

see page 10

ICRI MISSION STATEMENT

The mission of the International Concrete Repair Institute is to be a leading resource for education and information to improve the quality of repair, restoration, and protection of concrete and other structures in accordance with consensus criteria.
ICRI is an organization composed of Engineers, Consultants, Contractors, Manufacturers and other Material Suppliers, Property Managers and Owners all working together for the betterment of the industry and of all involved. Providing an open forum to speak about our work, new technologies and methods, exchange ideas.
Creating and following standards to produce the best results for all involved.

PRESIDENT'S MESSAGE

We started the year off with a well attended joint meeting with ACI in February with a highly informative presentation on the Woodrow Wilson Bridge project. Please plan to attend the second membership meeting, as the topic of Non Destructive Testing will be discussed.

Our goals for the year are:

- Retain the Chapter of the Year status
- Grow the chapter membership and attendance at meetings
- Increase chapter sponsorship
- Complete our chapter history documentation and the chapter history webpage
- Finish the chapter incorporation process in compliance with the IRS

We have achieved two of the five goals already. We are pleased to announce that Jay Whitton has received confirmation from the IRS that our Chapter is now officially a 501(c)6 organization. It has been a long process to reach this milestone. Great work Jay! Our Chapter was also recognized as the Chapter of the Year for ICRI at the National Spring Convention. This makes it two years in a row that we have been judged to as the best out of 34 chapters in the world. Now the challenge will be to complete a "three-peat." Congratulations to all of the membership for your hard work and active participation. This was also a well deserved acknowledgement of the outstanding leadership provided by Matt Nachman last year.

We are also in a campaign to sign up sponsors for the year. We have many returning sponsors and several new companies that have come on board, and we always have room for more. Your support of the Chapter allows us to make a difference to students, the community, and our members.

As we enter into spring and our busiest season, we want to remind you of the following:

- The student scholarship deadline is approaching in June. Please check out the website to download an application form.
- Applications for Outstanding Project Awards will be due in September. This date tends to creep up on us, since we work hard all summer without a chapter meeting.
- Our Chapter Outreach programs will be starting soon at Carver Vocational Technical High School in Baltimore, Habitat for Humanity in Garrett County, and the Gospel Rescue Mission in Washington, DC. Please watch for upcoming announcements from Pat O'Malley and Mike Miller.

We always have opportunities for volunteers on our technical committees. To become involved, feel free to contact any committee chair. Neil Savitch is constantly in need of articles to print in the Aggregate. Please send him all papers, announcements, technical updates, etc. that you would like to have published.

Please check our updated website www.icribwchapter.org for the calendar of events for the year and for contact information of the current Board of Directors. You will also find that we have recently added a page with back issues of the Aggregate from 2003 to the present.

We are always seeking your input so that we can continue to meet the needs of the membership as well as allow us to set the standard as the leading and largest chapter in ICRI.

Chris Carlson
Engineering and Technical Consultants, Inc.

THE BALTIMORE WASHINGTON CHAPTER OF ICRI

Thursday, May 5, 2011
Holiday Inn College Park
10000 Baltimore Blvd.
College Park, MD
301-345-6700
Exit 25 (Baltimore Blvd. North US 1) off Beltway
Hotel on Left

Advance Reservations by 04-28-11:	$50
After 04-21-11 & Non Members:	$60

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

ASSESSMENT OF EXISTING STRUCTURES IN THE ABSENCE OF DRAWINGS

OUR FEATURED SPEAKER

Keith Kesner, Ph.D., P.E., S.E.
Associate, WDP & Associates, P.C., Norwalk, CT

Keith Kesner is an Associate with WDP & Associates, Inc. (WDP) of So. Norwalk, CT, a consulting engineering firm that specializes in the evaluation and rehabilitation of existing structures, with offices in Charlottesville, and Manassas, VA, Austin, TX and So. Norwalk, CT.

He is a Fellow of the American Concrete Institute and an active member of ICRI. He has over 18 years of professional experience as a structural engineer and is the author/co-author of over 90 publications and presentations on a variety of structural engineering topics. He was awarded the 2005 ACI Young Member Award for Professional Achievement and co-awarded the 1998 ACI Construction Practice Award. He currently serves on several ACI Committees and is the Secretary of the Connecticut Chapter of ICRI.

He is a registered Professional Engineer in several states. He received his Ph.D. and M.S. degrees from Cornell University and his B.S. degree from the University of Connecticut.

OUR FEATURED PRESENTATION

NON-DESTRUCTIVE EVALUATION (NDE) methods can play a key role in the evaluation of existing structures prior to their repair and rehabilitation.

The assessment of existing structures requires an understanding of the intended future use, structure type and dimensions, material properties used in the original construction, extent of deterioration if present and current building code status of the structure.

NDE methods can be used

- to locate reinforcing steel and other embedded objects;
- assist in the assessment of concrete strength;
- and locate internal flaws that are not readily visible.

A common complication of many repair and rehabilitation projects is the lack of available construction documentation showing design details and the properties of the materials used in the original construction or previous renovations and additions.

This presentation will describe the use of several NDE methods for assessment of existing structures, focusing on in-situ concrete material properties, structural size determination and the location of possible defects. Use of NDE results in structural analysis models and in the creation of "as-built" drawings of the structure will also be described.

REGISTRATION DEADLINE IS **April 28, 2011** NO-SHOWS WILL BE BILLED

Please email (oscarv@skaengineers.com) or print this page and fax to ***Oscar Valenzuela***, Secretary, at 301-881-8066 no later than April 28, 2011. Checks to ICRI BWC may be turned in at the meeting or mailed with your form to:

Oscar Valenzuela, Secretary
ICRI BW Chapter
C/O Smislova, Kehnemui & Associates
12505 Park Potomac Avenue, Suite 200
Potomac, MD 20854
301-881-1441

You may also register and pay online at

www.ICRIBWChapter.org

Name: _____

Company: _____

Telephone: _____

Email: _____

Number of Guests: _____ Payment: ☐ Enclosed ☐ Online
(Please include receipt)

Guest Names: _____

_____

Guest's Company: _____

Fastener

continued from page 1

or installed that leads to a less then adequate fixing result. The veneer can be attached to a host of building elements which can include concrete, masonry, cold formed metal stud, or wood stud, and structural steel. The challenge is how the connection to the parent structure is made. In part 1, we will discuss the application of veneer ties connected to concrete and masonry structures.

Selecting a proper fastener and requiring an acceptable installation procedure to connect a wall tie to the structure is as important as the tie selection. Keep in mind that once the veneer is constructed, the fastener connection is not serviceable. A non-compatible fastener married to a formidable wall tie develops a compromised tie. The analogy of "you're only as strong as your weakest link" plays true in the fastener use also. What type of fastening system should be used? What cautions should the engineer or installer be aware of regarding various fastener types? How effective is the fastener for the application? Is the fastener's stiffness as good as the tie selected? How sensitive to installation challenges are the various type of anchors or fasteners?

CONCRETE AND MASONRY BACK-UP APPLICATION

Brick tie products typically specified are dovetail slots and dovetail anchors or hook and eye reinforcement for the concrete and masonry applications respectively. If typical product placement and serviceability are effected by installation issues, or a veneer is to be added to an existing concrete or masonry wall, an alternate veneer anchor method will be required. Once selected, how is it fastened to the concrete or masonry?

DOVETAIL ANCHOR WITH EXCESSIVE FREE PLAY GREATER THAN 3/8"

Tie Selection:

Adjustable ties are preferred and they can be a base plate with a "v" or triangular tie, a plate and two leg pintle, or a single post and tie system. The selection is a function of the wall make up, waterproofing/ flashing and insulation applied if applicable. Ideally, the base plate should make firm contact with the concrete or masonry in order to assure compression load transfer. Extended legs for piercing the insulation are taxing to maintain a perpendicular installation to an irregular surface and will challenge the tie assembly to effectively transfer the compression load. Also note, that two screw installations are not for redundancy, but performance. A loss of one fastener for a two screw set renders the tie compromised and remediation is required. Also, the plate assembly must have holes large enough to accommodate the selected post installed fastener. A 5/16" diameter hole would be the required hole size for a 1/4" anchor for instance.

Fastener Selection

The connections to the concrete have many options. The first step is to quantify the order of magnitude of loads for the fastener to resist. Adjustable ties spaced at 1 per 2.67 sq ft are expected to resist a tension and compression load. The basic live load as calculated can be as low as 21 psf for a non-essential structure based on 90 mph wind speed. The resulting force is 56 lbs tension and compression. When applying a 4:1 safety factor, an anchor allowable load greater then 225 lbs would be useful and marginally acceptable. If a seismic condition exists, the live load can be 70 lbs or greater and the allowable load for the fastener can be 280 lbs.

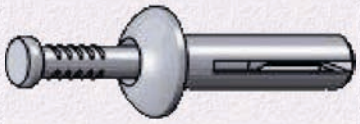
Next, one needs to evaluate the method of anchorage to the concrete. Anchors to concrete or masonry can be torque activated, hammer set expansion types, threaded screws, power actuated pins, or hammer

driven nails. Depending upon the tie system selected, the length or type of fastener must comply with the thickness of the base plate to be attached plus the minimum embedment required for the fastener to achieve the loads induced. Since this fastener must partner with a plate or tie assembly, the functional and material compatibility with the tie is important.

TYPICAL TORQUE TYPE ANCHOR

TYPICAL THREADED FASTENER

Torque applied anchors are an ideal solution for the plate attachment. Besides providing a measurable clamping force, the installed anchor can be inspected. Applying a 4 ft-lb (48-50 in-lb) torque can produce a preload greater then 900 lbs. This is a typical installed torque for ¼" torque type anchors. Since the preload exceeds the allowable and allowing for creep and relaxation of the installed torque (usually 35-50%), the choice would be acceptable (check with anchor manufacturer regarding the appropriate installed torque and the resulting induced clamping force). Stud type anchors can take 4-6 turns of the nut to achieve the installation torque. The stud projection from the plate surface could be ¼ - 3/8" above the surface of the nut. The total anchor projection distance of ½" – ¾" can interfere with the placement of insulation or the vertical travel of the adjustable tie in the base plate. Therefore, a torque activated anchor having a hex head finish is best.



TYPICAL NAIL DRIVE EXPANSION

TYPICAL TOGGLE

The use of anchors other than torque controlled expansion has limited appeal. A nail drive system does not draw the plate tight to the concrete or masonry surface. If not properly inserted and activated the anchor can expand prematurely, and the plate connection would be loose to the surface. This will have a negative impact on the free play of the tie and result in excessive deflection. Except for a visual identification, a physical inspection that would indicate the tie system is secured to the building is not possible. This would be true of any nail or hammer driven anchor. The toggle is torque applied, but the hole size required for a ¼" bolt is ¾" in a hollow application such as CMU. A large drilled hole such as this will play havoc with air and water permeance.

SUMMARY FASTENER SELECTION

- ⇨ Determine loading requirements for the application and select an anchor that can meet or exceed the applied loads.
- ⇨ Size matters, be certain the anchor selected fits the base plate holes and is adaptable to the base material (concrete, brick, block, etc)
- ⇨ Select a torque controlled expansion type anchor
- ⇨ Select a torque activated expansion anchor having a hex head finish
- ⇨ Select an anchor with a compatible finish, similar to the tie assembly.
- ⇨ Establish a minimum installed torque that meets or exceeds the applied loads
- ⇨ Avoid non-metallic anchors
- ⇨ Avoid hammer or power driven anchors, especially in hollow CMU.
- ⇨ Check for edge distance and center to center distance criteria for placement and performance assurance.

Stephen Getz, BSCE, is the President and owner of Construction Tie Products a manufacturer and supplier of masonry ties, stone anchors, masonry restoration anchors and fasteners for the masonry industry.

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ETC

Upcoming Chapter Events

May 5, 2011 **ICRI-BWC 2nd Quarter Dinner Mtg.**
Holiday Inn,
College Park, MD

Sept. 8, 2011 **ICRI-BWC 3rd Quarter Dinner Mtg.**
Holiday Inn,
College Park, MD

Oct. 6, 2011 **ICRI-BWC 2011 Golf Tournament**
Glenn Dale Golf Club
Glenn Dale, MD

Nov. 3, 2011 **ICRI-BWC Annual Awards Banquet**
Holiday Inn,
College Park, MD

Dec. 1, 2011 **ICRI-BWC Fall Technical Seminars**
Location: TBD

Upcoming National Events

Oct. 12-14, 2011 **ICRI 2011 FALL CONVENTION**
Theme: "Water & Wastewater Treatment Plant Repairs"
The Westin Cincinnati
Cincinnati, OH

Oct. 25-26, 2011 **CONCRETE SLAB MOISTURE TESTING PROGRAM**
Baltimore/Washington

April 18-20, 2012 **ICRI 2012 SPRING CONVENTION**
Theme: TBD
Hilton, Quebec
Quebec, QC, Canada

Nov. 7-9, 2012 **ICRI 2012 FALL CONVENTION**
Theme: TBD
Rancho Las Palmas Resort and Spa
Rancho Mirage, CA

SPONSORSHIP

ICRI-BWC STILL NEEDS YOUR HELP!

In 2010, we raised $15,300 with the help of our SPONSORS! Our thanks goes out to them!

It is time to start our 2011 Sponsorship Drive!

HELP US REACH OUR GOAL!

The money we raise will provide increased exposure for sponsoring companies to our local and national members and, in addition, provide an additional revenue source to expand and enhance the member service program of our chapter. So, PLEASE -

BECOME A SPONSOR!

VISIT OUR WEBSITE FOR MORE INFORMATION

WWW.ICRIBWCHAPTER.ORG

MEMBERSHIP MINUTE

BENEFITS OF MEMBERSHIP

- Industry Recognition
- Peer Networking
- Concrete Repair Bulletin and the Aggregate
- Technical Support
- Discounted Pricing for Publications

These are just some of the reasons for becoming a member of ICRI and the Baltimore Washington Chapter.

BECOME A MEMBER!

Despite some tough challenges with the economy the Baltimore/Washington Chapter of ICRI has been able to increase our membership over the last 6 months. Our increase in membership can be attributed to dedication of all the individuals and companies who continue to support our local chapter. Take note that renewal of your current membership is annual and that you will receive a reminder to renew several months in advance of expiration. If you know of anyone or any company who is interested in ICRI, have them contact a board member or myself so that we can guide them through the membership process OR encourage them to attend a dinner meeting. We look forward to seeing you at our next meeting.

Mike Prizzi
Membership Chairman
Metro Sealant & Waterproofing Supply

VOLUNTEERS NEEDED

The Baltimore-Washington Chapter is looking for volunteers to help clean-up the exterior of the Gospel Rescue Mission in Washington D.C. Work will begin in the spring of 2011.

Please contact Mike Miller with with Structural Preservation Systems at either mmiller@structural.net or 410-796-5000, if you would like to help.

Safety Column
Sanitation Conditions on the Jobsite

SANITATION CONDITIONS ON THE JOBSITE

By David Caple

With the approach of warm weather, more and more construction companies will return to working outdoors. Working on jobsites with limited or no access to facilities requires some additional planning in order to provide the required sanitary service for your employees.

Consider the following when pre-planning for site conditions:

Drinking Water: An adequate supply of potable (safe to drink) water must be provided for employees. These days, you see people bringing their own water to work everywhere you look, which represents a change from the water fountain or cooler that used to be more prevalent. However, even if your workers are following the same trend of supplying their own water, this does not negate the contractor's obligation to provide clean drinking water. In other words, if an OSHA inspector asks where to find drinking water on your worksite, responding that your workers bring their own is not a good answer!

Toilet Facilities: Every jobsite needs at least one toilet facility. If there are more than 20 employees and less than 200 on the jobsite, the required ratio is one toilet and one urinal required per 40 employees. At 200 employees, the ratio changes to one toilet and one urinal per 50 employees. These facilities must be maintained and if a portable "outhouse" facility is used, be sure to schedule regular flushing/pumping from the service company. As an inspector, I do check the bathrooms and I will report back if they are not up to standard.

Washing Facilities: For employees who handle chemicals, paints, concrete, poisonous plants or any other materials that could be considered a contaminant, the employer shall provide washing facilities. This piece of the puzzle is missing on more jobsites than any other elements. It is important that managers encourage their employees to clean up as needed, and in particular, before handling food items. It is very easy to ingest something you shouldn't by handling food without washing first. An easy and inexpensive solution to providing a wash station could be as simple as a 5 gallon bucket, soap and towels. It should not be hard for most of you in the construction industry to be creative.

Other parts of the sanitation standard for construction include:

- Designated eating and drinking areas away from contaminants and outside of contaminated areas.
- Vermin Control to exterminate rodents, insects, and other vermin, if detected.
- Changing rooms with storage facilities for employee's street clothes, if they are required to wear protective clothing at work.
- Showers, when required by other specific OSHA standards.

In planning for site conditions, it is important not to overlook the sanitation needs of your workers.

For more information or to recommend a topic for a future publication contact me at d.p.caple@gmail.com

LEGAL COLUMN

SBA ROLLS OUT WOMEN-OWNED SMALL BUSINESS FEDERAL CONTRACT PROGRAM

By Jennifer A. Mahar

On February 4, 2011, the U.S. Small Business Administration ("SBA") launched a new program known as the Women-Owned Small Business Federal Contract Program. The intent of the program is to expand opportunities for women-owned small businesses ("WOSBs") and economically disadvantaged women-owned small businesses ("EDWOSBs") to compete for and win federal contracts through the use of set asides.

The WOSB Federal Contract Program permits Federal agencies to set aside contracts for qualified WOSBs and EDWOSBs where:

- The North America Industry Classification Systems ("NAICS") code assigned to the contract is an industry in which SBA has designated that WOSBs are substantially underrepresented or EDWOSBs are underrepresented.
- The contracting officer has a reasonable expectation that two or more WOSBs or EDWOSBs will submit contract offers.
- The anticipated award price of the contract does not exceed $5 million in the case of manufacturing contracts and $3 million in the case of all other contracts.
- The contracting officer believes the contract can be awarded at a fair and reasonable price.

To begin participation in the WOSB Federal Contract Program, WOSBs and EDWOSBs must register in the Central Contractor Registration ("CCR") database, submit required documents to the online WOSB Program Repository, and represent their WOSB or EDWOSB eligibility status on the Online Representations and Certifications Application ("ORCA"). Certification for the program can be achieved through self certification using the SBA's on-line certification program or an SBA-approved Third-Party Certifier.

To be a WOSB eligible to participate in the program, the business must be a small business that is at least 51% unconditionally and directly owned and controlled by one or more women who are United States citizens, and the woman or women must manage the day-to-day operations, make long-term decisions for the business, hold the highest officer position in the business and work at the business full-time during normal business hours. To be an EDWOSB eligible to participate in the program, the business must meet the requirements for a WOSB plus be owned by one or more women who are "economically disadvantaged". A woman is presumed economically disadvantaged if she has personal net worth of less than $750,000 (with some exclusions), her adjusted gross yearly income averaged over the three years preceding the certification less than $350,000, and the fair market value of her assets is less than $6 million.

Additional information on this program can be found on the WOSB Federal Contract Program web page at www.sba.gov/wosb. To find Federal government contract solicitations that may be set aside under this program search the Federal Business Opportunities website at **www.fbo.gov**.

Do you have a legal issue you would like addressed in a future newsletter? Send me an email with your question to jmahar@smithpachter.com or contact me at 703-847-630

1ST QUARTER MEETING WRAP-UP

continued from page 1

The joint project between federal and three state government entities has been recognized by many for its innovation and was acknowledged as the 2008 Outstanding Civil Engineering Achievement by ASCE. The Woodrow Wilson Bridge is one of two critical metropolitan DC highway structures crossing the Potomac River at the Virginia - Maryland state line. This massive reconstruction project was budgeted for 2.54 billion dollars, but was actually brought in 7.45% under budget, thanks in part to a partnering effort between the authority, design team, and the contractors of record.

The bridge, which was originally built in 1961, has seen traffic grow from 77,000 vehicles a day to over 195,000 vehicles in 2009. The challenges for the design and construction team included incredible phasing difficulties while maintaining the heavy 200,000 vehicles per day traffic load. One of the signature design and structural elements of the bridge included the Segmental Delta Piers, which were precast on the nearby shore, barged to the bridge, and then post tensioned and laterally reinforced. The bridge itself consumed over 150,000 cubic yards of concrete with close to another 150,000 cubic yards added to the US 1 Interchange contract. For those of us in the restoration business THAT IS A LOT OF CONCRETE! Thanks Nick for the presentation and more importantly, thanks for the bridge and eliminating one major bottleneck in the DC commuters' day.

Clide Ellis of ACI presents Ronaldo T. "Nick" Nicholson, P.E., DDOT with a token of appreciation

"Is that MY cellphone?"

ACI & ICRI-BWC Members mingle and network during Social Hour

"I know I'm registered, Cindy!

Jay Whitton, *C.A. Lindman, Inc.*, and Taso Pantoulis, *Architectural Columns and Railing Systems,* discuss the structural integrity of coat racks!

2011 BUSINESS CARD SERVICE DIRECTORY