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IRMCA News

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IRMCA turns 30

IRMCA NEWS

Volume 30, Number 1 • Winter 2011

Illinois Ready Mixed Concrete Association

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Working together to create value, teach excellence, and produce quality.

Mission
To be the voice for the ready mixed concrete industry in Illinois. To promote the use of quality ready mixed concrete through innovative educational programs. To accomplish common goals as an organization that cannot be done individually.

Contents

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Projects

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Cover photo is a section of I-55 in Normal.

Announcements

► Staff Change
At its regularly scheduled meeting on September 7, 2010, the Board of Directors of the Illinois Ready Mixed Concrete Association voted to eliminate the position of Director of Marketing and Promotion, effective September 10, 2010. This decision was based solely on protecting the long range financial position of IRMCA and in no way reflects the performance of John Reed.

► Wanted: Project Details
The IRMCA staff is looking for successful projects to highlight in a new series of one-page project publications. Let us know about your projects and we will do all of the work! Contact us at 800.235.4055 or irmca@irmca.org.

► Condolences to the family and friends of...

...Eunice Oedewaldt.

...Ruth M. Ozinga.

Sustainable Committee Formation

Take a look at every industry magazine that arrives. What do they all have in common? Sustainability and concrete! Listen to the environmentalists and world leaders. What are they saying? Go green and go green now - or else! Observe how the major national concrete associations are allocating funds for sustainable concrete promotion, research and education. And the American Institute of Architects has set the year 2030 as the time limit for "carbon neutral" construction.

Though the message has been preached for decades, the movement to preserve our earth and its resources has become more vociferous and visible in the last 15 years. What has also become apparent during this time is that to sell a product (concrete or whatever), it needs to be sustainable.

Fortunately, we who produce and promote concrete ARE selling a sustainable product. However, sometimes we forget or just can't equate sales with "going green." The Illinois Ready Mixed Concrete Association is forming a new committee, the IRMCA Sustainability Committee, whose purpose is to keep itself and the Association membership abreast of new sustainable education and research results. More importantly, the committee will attempt to show members how learning about and becoming comfortable with the sustainable advantages of concrete can result in competitive advantages.

If you would like to join this committee – get on board as we start – please contact Bruce at bgrohne@irmca.org or call @ 800-235-4055. We hope to have our initial meeting in early February.

Name the staff member who...

(Bruce Grohne, Jennifer Bedell, Jim Randolph, JoAnn McKeown, or John Albinger)

1 ... became a registered lobbyist for IRMCA in 2007.
2 ... was IRMCA President in 1993.
3 ... spent time in the insurance industry before joining the IRMCA staff.
4 ... has spent 50 years in the industry.
5 ... studied piano performance while earning a degree in English.
6 ... started his IRMCA career in the position of Field Director.
7 ... was IRMCA President in 1997.
8 ... came to work for IRMCA in 2006.
9 ... was IRMCA President in 1988.
10 ... is the only current employee not hired by Bruce.

See answers below.

1. Jim, 2. John, 3. JoAnn, 4. John, 5. Jennifer, 6. Bruce, 7. Jim, 8. JoAnn, 9. Bruce, 10. Jennifer

Golf Outing

Reception Sponsors: Barnes Industrial, bronze; Big River Industries, silver; Brett Admixtures, bronze; Buzzi Unicem USA, gold; CEMEX, gold; Continental Cement Company, gold; ESSROC Cement Corporation, gold; General Resource Technology, silver; Holcim (US), Inc., gold; Illinois Cement Company, gold; Lafarge North America, gold; Lehigh Cement Company, gold; McNeilus Company, silver; St. Marys Cement, gold; Sika New Construction, silver; Vulcan Materials, gold; W.R. Grace & Company, silver.

Clockwise from above photo: Rich Gardner, Jake Miller, Curt Eichen, Keith Nault; John Albinger; Frank Busicchia and Bob Pfeffer; More than 90 participants ready to start.

IRMCA *The Presidents*

1981 ~ Dean Amundsen
1982 ~ Jan Wanstreet
1983 ~ Jerry Hodel
1984 ~ Thorlow Baker
1985 ~ Mike Winter
1986 ~ Ray Michels
1987 ~ Ray Michels
1988 ~ Bruce Grohne
1989 ~ Lou Marcy
1990 ~ Sieb Vander Wagen, Jr.
1991 ~ Rich Schwend
1992 ~ Dan Edwards
1993 ~ John Albinger
1994 ~ Mark Blager
1995 ~ Bob Brown
1996 ~ Rob Nelch
1997 ~ James Randolph
1998 ~ Jay Nolan
1999 ~ Joyce Raspolich
2000 ~ Monte Bartels
2001 ~ Paul Flynn
2002 ~ Dan Edwards
2003 ~ Tim Huiner
2004 ~ Dennis Oedewaldt
2005 ~ George Mobarak
2006 ~ Dennis Probst
2007 ~ Ken Highlander
2008 - Cheryl Moeller
2009 - Cheryl Moeller
2010 - Justin Ozinga
2011 - Justin Ozinga

Clockwise from left:
Mark Blager, Lou Marcy, Jim Randolph, Justin Ozinga, Cheryl Moeller, Tim Huiner.

2011 marks the 30th anniversary of the Illinois Ready Mixed Concrete Association. Throughout the year each issue of the *IRMCA News* will feature highlights of IRMCA's history.

Village Steps Up Use of Concrete Overlays

PCA Executive Report – November 1, 2010

After the initial successful completion in 2003 of a 4-inch concrete overlay for one of its residential streets, the Village of Lombard, a western suburb of Chicago, selected concrete overlays to rehabilitate five industrial service roads in an industrial park. These roads carry up to 1250 vehicles per day with approximately 12 percent truck traffic. The existing asphalt pavements had experienced severe cracking and rutting, causing maintenance and safety concerns. A concrete overlay was viewed by the village as an excellent, low-maintenance, long-term solution.

Illinois Chapter - ACPA met with the village engineer and geotechnical consultant almost a year prior to construction to discuss design details and construction sequence. Additionally, a couple of challenges needed to be overcome. One was the inability to maintain the existing grade with the addition of a 4-inch thick concrete overlay. Insufficient asphalt thickness did not allow the existing pavement to be milled the full depth of the overlay. As a result, the exiting asphalt was scarified only one-half inch and grade was raised to accommodate the new pavement.

The village was also concerned about minimizing business disruption. The contractor and consultants implemented a construction staging plan which allowed the businesses to maintain deliveries and minimize interruptions. In addition, the concrete mix design allowed the pavement to be opened in as little as three days.

Plote Construction was the concrete paver contractor and Prairie Material supplied the concrete. Work began early this summer and was completed this fall.

On October 15, the Village of Lombard, Civiltech Engineering Inc., Plote Construction and the Illinois Chapter - ACPA sponsored an open house to observe the construction process. More than 30 consultants and local municipal officials attended the event and were impressed by the speed of construction and overall appearance of the overlay project.

WEBSTER

R-VALUE: a measure of resistance to the flow of heat through a given thickness of a material (as insulation) with higher numbers indicating better insulating properties.

U-VALUE: a measure of the heat transmission through a building part (as wall or window) of a given thickness of a material (as insulation) with lower numbers indicating better insulating properties.

Massachusetts Institute of Technology

Concrete Sustainability Hub
Research Update

Just over a year ago, the Portland Concrete Association and the RMC Research & Education Foundation each pledged $5,000,000 (over 5 years) to establish and fund The Concrete Sustainability Hub (CSH) at the Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts. MIT was chosen largely because it has the #1 engineering school in the country and its reputation for thorough research is impeccable. PCA and RMC are confident that independent studies at MIT will confirm concrete as the sustainable paving and building product of choice.

Researchers will focus on 3 areas: concrete materials science, building technology, and the econometrics of sustainable development. Additionally, they will help set a new standard in life-cycle assessment (LCA) modeling. The studies will quantify the cradle-to-grave environmental costs of paving and building materials, and will ultimately result in the most comprehensive LCA model produced to-date.

Recently, MIT released preliminary research findings on the life-cycle assessment work they have been doing at CSH. The scope and detail of MIT's LCA model will set their current efforts apart from previous work. According to MIT professor and research team leader John Ochsendorf, the expanded life-cycle window – 50 years for paving materials and 75 years for building materials – combined with the level of detailed analysis conducted on the use phase of structures and pavements will distinguish MIT's latest research. Initial reports have shown the importance of including the use phase, with MIT researchers finding that more than 90 percent of residential building life-cycle carbon emissions and up to 85 percent of highway pavement emissions occur during this period.

You can access the initial findings via the RMC Research & Education Foundation's home page at *www.rmc-foundation.org* or the MIT CSH web site at *http://web.mit.edu/cshub/*. IRMCA will continue to receive additional communications and tools from the National Ready Mixed Concrete Association and Portland Cement Association about how you can use and apply the MIT findings to your local operations and efforts. As soon as we receive these tools they will be passed on to IRMCA members.

IRMCA Helps Fund Student's Research

By Amanda Bordelon

Amanda Bordelon, Ph.D. Candidate at University of Illinois Urbana-Champaign, has been working on fiber-reinforced concrete for use in thin concrete pavement design since 2004. Thanks to the financial support from IL-ACPA, IRMCA and PCA Great Lakes Region members, she was able to construct a 330-ft demonstration project of Flowable Fibrous Concrete (FFC) Inlay, a new sustainable pavement preservation concept, in Rantoul. This new design consists of a 2-inch wearing surface of the FFC mixture placed into a milled asphalt roadway. The FFC is designed to have a higher structural fiber-reinforcement content than typical paving mixtures to reduce cracking and improve load carrying capacity of the slabs. The mixture requires a slightly higher cementitious content and well-graded aggregate blending to make the mixture much more workable, thus reducing construction equipment and time. For more information about this project, feel free to contact Amanda at bordelon@illinois.edu.

Editor's note: Amanda Bordelon was an IRMCA scholarship recipient in the 2006-2007 school year.

Photo courtesy of Amanda Bordelon

Stearns Road Corridor

In 1990, then Congressman Dennis Hastert spearheaded an effort to find a location somewhere in the Fox Valley area to build a major regional corridor across the Fox River. Twelve years later, Stearns Road was selected out of 20 other possible locations in McHenry and Kane counties. Preliminary engineering and design began in 2002, and final engineering began in 2006. Among many national and local dignitaries, Hastert was present on the morning of December 15, 2010, to see his vision turn into a reality.

The project. The Stearns Road Corridor includes a new Fox River Bridge (a 1,100-foot span over the Fox River) and a 4.6-mile new road realignment that extends from approximately the Kane/DuPage County line to Randall Road. Also included in the project is the widening and resurfacing of IL Route 25 from the Chicago Central and Pacific Railroad to the IL Route 25 Bridge over Brewster Creek. With two 12-ft lanes in each direction, separated by a median, the Stearns Road corridor and new Fox River Bridge establish an east-west traffic corridor linking Route 59 on the east with Randall Road on the west. Drivers now will have a way to cross the Fox River along the 5.5 miles between Route 64 in downtown St. Charles and State Street in South Elgin.

The cost. The $146.8 million project, which includes $1.1 million in American Recovery and Reinvestment Act dollars and $77 million in federal-aid highway funding, is considered the largest infrastructure project in the history of Kane County. Kane County Board Chairwoman Karen McConnaughay said that "this largest infrastructure project in Kane County's history was finished on time and below budget."

The employment. The Federal Highway Administration estimated that 220 employees from the Kane County Department of Transportation and various contractors, consultants and laborers worked on the project every day until its completion.

The environment. The Stearns Road Corridor was built not just to avoid harming the environment, but to reinvigorate it. The project created 216 new acres of open space, including new retention areas and wetlands that can hold as much stormwater as 20 Olympic-size swimming pools. Also, no soil was trucked out of the site or brought in from elsewhere. Soil dug to create the new retention areas was used to build up the road base in other areas. Further, the project includes 7 miles of new trails and a new bridge for pedestrians and bicyclists to cross the Fox River.

The concrete. Illinois Department of Transportation mixes were provided by IRMCA members Elmhurst Chicago Stone and Meyer Material. Placing the concrete were Martam Construction, F H Paschen Construction, and Sjostrom & Sons Construction. The overall project was managed by Alfred Benesch & Company.

New Online Industry Resources

New Web Site for *Concrete Construction* Magazine

Joe Nasvik, Senior Editor, *Concrete Construction Magazine*, reports that his organization has launched their new web site, *www.concreteconstruction.net.* The new site provides articles and news on new products, problem solving, decorative concrete, surfaces, safety, sustainability, technology and much more. As an added feature, every article ever written for the magazine can now be accessed in searchable ways.

IRMCA recommends that its members take a look at this site; we are certain it will become one that you will come to depend on. Thanks to *Concrete Construction Magazine*!

NRMCA Promotes Streets & Local Roads

The National Ready Mixed Concrete Association has announced a new, aggressive promotion program designating streets and local roads as the primary target. The efforts are being designed to work with the American Concrete Pavement Association in making strides towards increasing our market share in these areas.

In addition to new pamphlets and other promotional materials NRMCA has added a new web site, *www.concretestreets.org*, that offers users many guides for successful promotion.

Concrete promoters should access this site as well as other NRMCA sites for valuable information and guidance.

Randell Riley Awarded for Outstanding Pavement Promotion

Photo courtesy of ACPA.

The ACPA (American Concrete Pavement Association) Outstanding Pavement Promotion Award has been awarded selectively since 1998. It is presented to an individual or group who has made significant contributions through promotion efforts or programs to advance the awareness, specification, and/or placement of concrete pavements. The recipient must be an employee of an ACPA member-company, ACPA national staff, or staff of a local chapter/state association affiliated with ACPA.

The ACPA Outstanding Pavement Promotion Award recipient for 2010 is Randell Riley, P.E., Executive Director of the Illinois Chapter-ACPA, for his tireless and successful promotion of concrete pavement solutions on lower volume country roads, city streets, and bus pads—including thin concrete overlays—in the State of Illinois. Riley is well known and also was cited for his technical expertise, as well as his tireless efforts to advocate for quality concrete pavement design, construction, rehabilitation, and preservation.

This announcement was originally published by ACPA.

The Concrete Test Report

What the designer needs to know

By Luke M. Snell

Probably the most common report in the concrete industry is the concrete test report. Typically, a report is sent when a 7-day break is completed. Later, the same report is updated and resent with the 28-day test results. On a large project, these reports will quickly accumulate. So, what information can be determined from these reports?

The concrete test report serves one basic purpose: to assure those involved with a project that the right concrete was delivered to the job site. While the format of test reports can vary from one testing laboratory to the next, each will contain the information needed to determine whether the concrete meets the job-site requirements. In the U.S., a concrete test report provides documentation that random samples of fresh concrete have been taken as required in the project specifications and ASTM C172 and that a prescribed series of tests has been conducted in accordance with ASTM C31 and C39. Some of the key things that need to be reviewed in a report include:

- Identifying data, including the job-site name and location, the name and location of the laboratory, and the identification numbers of the test specimens;
- Ambient temperature at the job site;
- Location where the concrete represented by the samples has been placed in the structure;
- Date and time of sampling, as well as the identity of the individual who took the sample;
- Test results on fresh concrete (generally slump, air content, and concrete temperature);
- Curing method for the concrete samples, as well as high and low temperatures that the concrete samples underwent while in the field;
- Compressive strength of each test specimen (reported to the nearest 10 psi [0.1 MPa]);
- Type of fracture pattern; and
- Ages of the specimens when tested.

Some test report forms include space for optional comments. Useful comments might include whether water or admixtures were added at the site. A sample should be taken only after all of the water has been added to the mixture. Technicians should always note when they observe any deviations from test standards. For example, visible defects in a test specimen or cap should be noted in the test report; however, laboratories should avoid making judgments based on incomplete data. For example, some laboratories make it a practice to indicate, based on a 7-day break, that the anticipated 28-day strength will be too low. As noted in the following discussion, such a practice may not be warranted.

►INTERPRETING THE RESULTS

If you are the Engineer of Record, you'll normally receive an initial set of reports after the 7-day breaks. These can be used as an early indication of the official 28-day strength. For a typical portland cement concrete, the 7-day strength is about two-thirds to three-fourths of the 28-day strength. Be careful, though! If your concrete mixture contains fly ash, for example, the strength gain may be considerably slower than for a concrete mixture with portland cement only (Fig. 1).[1] Comparing the two may cause unnecessary distress and even panic. You'll have a much better basis for comparison if your concrete supplier has strength-gain data for the particular concrete mixture being evaluated.

Another thing to keep in mind is that an official compressive strength test in accordance with ACI 318-08, Section 5.6.2.4,[2] is the average of two 6 x 12 in. cylinders or three 4 x 8 in. cylinders, not a single cylinder break. A single, apparently low break could be significant, but it's almost impossible to know exactly what it means. If you need a reliable indication of the 7-day strength, break enough cylinders to provide an official test.

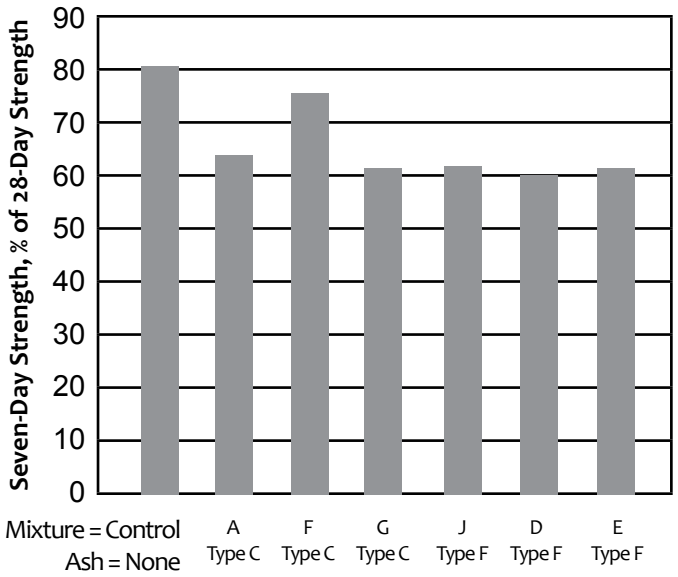

Fig. 1: The rate of strength gain is a function of the mixture proportions, so there is no single ratio that can be used for predicting the 28-day strength. In this test series, a control mixture comprising portland cement achieved about 80% of its 28-day strength in 7 days. Other mixtures with 25% fly ash replacement achieved from 60 to 75% of their 28-day strengths in 7 days (data from Reference 1)

It's helpful to track the measured strength of the concrete using a simple quality control chart of strength versus test date.[3] That way, you can see any patterns that develop. Another plot that could provide a useful indication of what should be expected for 7-day results is a chart of the ratios of the 7- and 28-day strength results.

►WHAT IF A TEST RESULT ISN'T ACCEPTABLE?

ACI 318-08, Section 5.6.3.3, gives two criteria for accepting the strength of the concrete:

- The average of any three consecutive strength tests equals or exceeds f'_c; and
- No individual strength test falls below f'_c by more than 500 psi when f'_c is 5000 psi or less or by more than 10% of f'_c when f'_c is greater than 5000 psi.

If the test result fails to meet either of these criteria, you'll need to take appropriate measures for the concrete represented by the failed test(s) and for any concrete yet to be placed on the job. Details of how to apply these procedures are given in ACI's Concrete Knowledge Center.[4] But what measures are appropriate?

Checking the procedures

It's helpful to keep in mind that almost any deviations from the procedures specified by ASTM C31, "Standard Practice for Making and Curing Concrete Test Specimens in the Field," or ASTM C39, "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens," will result in artificially low-strength test results. The first thing to do is to check that everything was done according to the standards. A good report will leave plenty of tracks to follow, and you should check them all, preferably with the cooperation of the testing laboratory.

Ideally, the laboratory will have done some checking before issuing the report. They may also have internal records of additional data they don't include in their written reports but that could provide additional clues. Although not all laboratories do so, it's good practice to retain all specimens that fail to meet the specified strength to aid in the investigation. Some specific items to look for include:

The concrete test report serves one basic purpose: to assure those involved with a project that the right concrete was delivered to the job site. While the format of test reports can vary from one testing laboratory to the next, each will contain the information needed to determine whether the concrete meets the job-site requirements.

- Mishandling of the specimens either directly after casting or when moving them from the field to the laboratory. Gripping freshly cast specimens from the top can distort them. At 24 hours, specimens are relatively fragile and must be protected from jarring and excessive vibration;
- Curing temperature in the field. ASTM C31 requires that the temperature of field-cured cylinders be maintained between 60 and 80°F (16 and 27°C) or 68 and 78°F (20 and 26°C) for concrete with a specified strength of 6000 psi (40 MPa) or greater. If the temperatures were lower, the early-age strength tests will tend to be low, but the later-age strength tests will recover; higher temperatures tend to have the opposite effect. Freezing the specimens at early ages can cause permanent damage;
- Excessive relief of the finished surface of the cylinder. The tolerances are slightly different depending on whether bonded or unbonded caps are used. If the relief exceeds the tolerance, the surface of the specimen needs to be cut or ground;
- Asymmetric loading of specimens (that is, specimens not properly centered in the testing machine). The test report should make a note of asymmetric failure modes; and
- If the concrete contains a significant quantity of fly ash or slag, do not expect the 7-day breaks to reach two-thirds or three-fourths of the 28-day strength values. Also, be aware that these concretes will be more sensitive to low curing temperatures.

If you find any errors in the testing procedures, make sure they're corrected and note any test results that are suspect. If you can't find errors in the testing procedures, then there is likely something wrong with the concrete itself—probably stemming from an error that will be harder to determine. Some detective measures are described in the following, but your first step is to examine the concrete delivery ticket and verify that the right concrete was sent to the site. You should also check the batch weights against the concrete submittal to make sure that there are no significant errors in batching.

Improving future test results

As previously indicated, the testing procedures themselves can be significant sources of unacceptably low strengths. The testing laboratory should go over all of the procedures point by point to make sure that they are in full compliance with the relevant standards (ASTM C31, C39, and either C617 or C1231 for bonded or unbonded caps, respectively). You can also verify that all technicians have the appropriate certifications for laboratory or field testing (from ACI or other organizations) and that the laboratory maintains certification from the Cement and Concrete Reference Laboratory or another relevant agency.

Your test reports should include the air content of the fresh concrete, and they should note any water or admixture additions made on site. It may be possible to correlate lower-strength tests (not necessarily unacceptable strength tests) with high air contents or late additions of water.

The times when the concrete was batched and sampled are noted on the batch ticket and should also be noted on the test report. Particularly in hot weather, long delivery times can adversely affect the concrete. On large jobs, your plot of strength versus test date will provide an indication that a low test result could stem from seasonal or weather-related causes. You may see lower strengths in August, for example, due to the adverse conditions imposed by hot weather.

Investigating suspect concrete in place

The question of what to do with suspect concrete is complicated. Removing concrete is costly and causes delays in the project, especially when a lot of time has passed since the concrete was placed. For starters, it's critical to locate the suspect concrete placement within the structure for a possible investigation of the concrete properties.

ACI 318-08, Section 5.6.5.2, states, "If the likelihood of low-strength concrete is confirmed and calculations indicate that load-carrying capacity is significantly reduced, tests of cores drilled from the area in question in accordance with ASTM C42 shall be permitted. In such cases, three cores

shall be taken for each strength test that falls below the values given in 5.6.3.3(b)." If you are the engineer on the project, the locations of the cores should be selected in consultation with you because you need to determine which areas of the structure are critical.

It can be extremely useful to employ nondestructive testing techniques to detect areas of relatively high or low strength within the portion of the structure in question. Most specifications don't require testing for every truckload of concrete, so there could be considerable variation within the portion of the structure being investigated. A cover meter or ground-penetrating radar should be used to locate reinforcing steel and prestressing strand so it can be avoided during coring. It may be useful to take additional cores for additional strength tests or for petrographic examination to determine the cause(s) of the low strength, either to aid in improving future performance or to assign responsibility for the costs of remedying the problem. Depending on the dimensions, it may be possible to remove a portion of a core for petrographic examination and use the rest for a strength test.

ACI 318-08, Section 5.6.5.4, states, "Concrete in an area represented by core tests shall be considered structurally adequate if the average of three cores is equal to at least 85% of f'_c and if no single core is less than 75% of f'_c." If the strength is determined to be unacceptably low, you (the engineer) will need to determine whether to remove and replace the deficient concrete or to take some other remedial measure. In this situation, nondestructive test methods may be helpful in determining where to take additional cores to pinpoint the locations where concrete must be removed. In the specific case where it is known or suspected that excessive quantities of fly ash or slag cement were batched, however, it may be that the strength will eventually reach satisfactory levels. In that case, it may be helpful to take extra cores to cure at elevated temperatures as an indication of the later-age strength.

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4. Snell, L.M., "Acceptance of Concrete Test Results," ACICommittee E702 Example Problems, Concrete Knowledge Center—Designing Concrete Structures, accessed at www.concrete.org/Technical/CKC/Designing_Concrete_Structures.htm, accessed Oct. 1, 2010.

Luke M. Snell, FACI, is a Senior Construction Materials Engineer with Western Technologies, Phoenix, AZ. He has done extensive consulting work on construction and concrete problems throughout the U.S., Saudi Arabia, Mongolia, and Algeria. He is the Chair of the ACI International Committee and past Chair of ACI Committee 120, History of Concrete. He is a member of several ACI committees, including the Young Member Award for Professional Achievement; the Board Advisory Committee on ISO TC-71; the Chapter Activities Committee; 214, Evaluation of Results of Tests Used to Determine the Strength of Concrete; E702, Designing Concrete Structures; S801, Student Activities; and S802, Teaching Methods and Educational Materials.

This article originally appeared in the December 2010 issue of *Concrete International* and is reprinted here with the permission of the American Concrete Institute. It is a continuation of the "What's This Report For?" series, based on a technical session sponsored by ACI Committee E702, Designing Concrete Structures.

Note: Additional information on the ASTM standards discussed in this article can be found at *www.astm.org*. Selected for reader interest by the editors.

Innovative, sustainable projects receive GreenSite Awards

By Jennifer Bedell

In November 2010 *The Concrete Producer* and *Concrete Construction* magazines announced recipients of the Third Annual GreenSite Awards, an honor given to projects that best demonstrate the concrete industry's contribution to sustainable construction. "Once again, the concrete production and concrete construction communities have demonstrated that concrete is at the forefront of the sustainability movement," said Tom Bagsarian, editor of *The Concrete Producer*.

Producers and contractors submitted photos and entry forms detailing their projects. "The entries in this year's awards program demonstrate the sustainable, long-term planning our country needs to repair and construct and infrastructure that will serve generations to come," said Tim Gregorski, editor of *Concrete Construction*. "The concrete industry is at the foreground of this movement and can contribute in many more ground-breaking and innovative projects."

A winning project was selected for each of the eleven categories:

► **Commercial: Proximity Hotel, Greensboro, North Carolina.** This 55,000 square-foot building features precast concrete walls with continuous insulation.

► **Demonstration: Tennessee Concrete Association Concrete Village, Nashville, Tennessee.** The concrete village is a living showcase for concrete.

► **High-rise: W Hollywood Hotel and Residences, Los Angeles, California.** Best Management Practices Stormwater Design catches and treats 90% of rainfall.

► **Industrial: Taum Sauk Upper Dam Restoration, Annapolis, Missouri.** Rock used to construct the original dam was used as aggregate for the new RCC dam.

► **Institutional: Erie Art Museum, Erie Pennsylvania.** Macrosynthetic replaced steel reinforcement in the ground/polished concrete floor.

► **Landscaping: Begent Residence, Del Mar, California.** Concrete counter tops, integral topping and pavers were used.

► **Multi-family housing: Vancouver Olympic Village, Vancouver, British Columbia, Canada.** A sustainable living showcase that, in its new role as a socially inclusive community, is one of the greenest neighborhoods in the world.

► **Municipal: Coyote Ridge Corrections Center, Connell, Washington.** The first U.S. prison to achieve LEED Gold certification.

► **Reader's Choice: One World Trade Center – Freedom Tower, New York City, New York.** Building design of the Freedom Tower includes innovative, high-strength concrete column mixes.

► **Rehab/retrofitting: Bordley Randall House, Annapolis, Maryland.** This project sets a precedence for the use of green construction (in this case, pervious pavement) in historic residential projects.

► **Residential: The Hawthorne Residence, Tampa, Florida.** This project demonstrates that there is no need to sacrifice aesthetics when building a green, predominantly concrete home.

Additional project details and slide shows can be found at *www.greensiteawards.com*.

Once again, the concrete production and concrete construction communities have demonstrated that concrete is at the forefront of the sustainability movement.

- Tom Bagsarian

Concrete Village Recognized for Showcasing the Product's Sustainability

Tennessee Concrete Association (TCA) created its Concrete Village in Nashville, Tennessee, to be a living showcase for concrete. Completed in September 2010, the showcase highlights concrete attributes such as low impact development strategies, energy efficiency, durability, safety, creativity and sustainability. TCA hosts site tours for designers, owners, members and regulators.

During the two-year construction, TCA members provided more than $150,000 of in-kind support. Features of the village include pervious parking, a concrete fence, an ICF knee wall, conventional concrete parking, flower pots, a rain water cistern, a safe room, superior walls, a perimeter wall and security fence, a rain garden, a concrete bench, a TN decorative slab, Centurion stone veneer, a top cast slab, an association logo slab, a Compass Rose decorative slab, and a textured walkway. Additional construction will include a tilt-up building and polished floors.

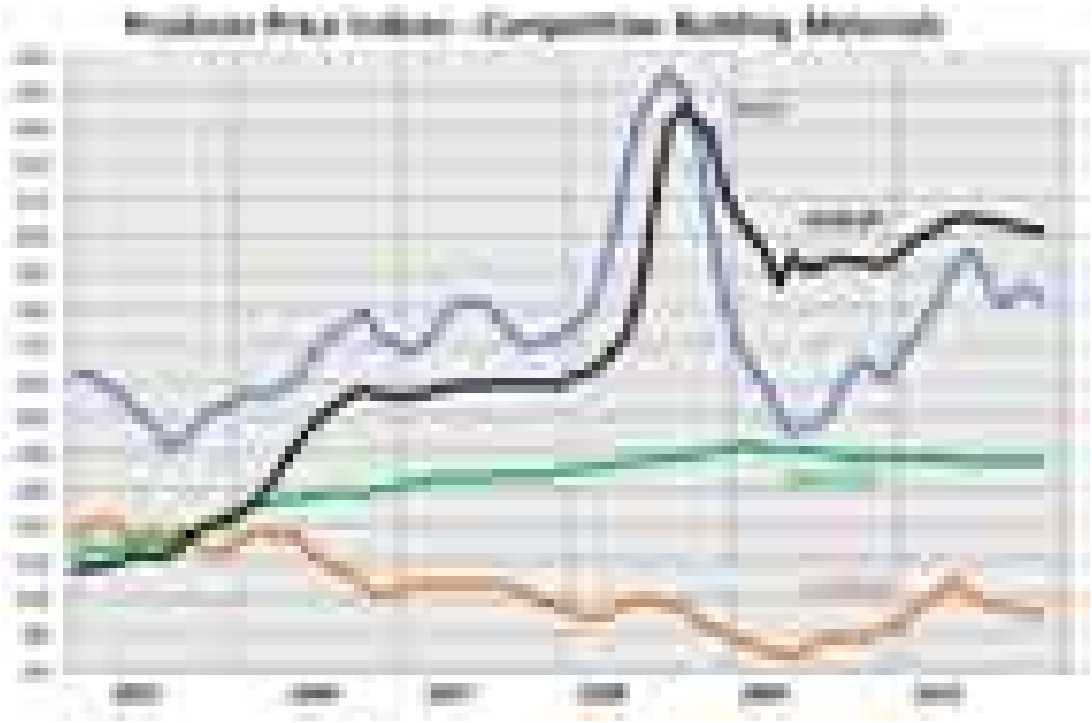
Dollar *for* Dollar

By Randell Riley, P.E.

"I don't get no respect." That line made famous by comedian Rodney Dangerfield pretty much sums up your situation if you are a pavement promoter. The conversations usually go something like this abridged version:

P (promoter): *We last longer.*
C (customer): *It costs too much.*
P: *We have lower maintenance costs.*
C: *It still costs too much.*
P: *We cost less to light.*
C: *That gets paid out of the utility bill. Not my problem.*
P: *We're "sustainable.*
C: *We are done.*

Figure 1 - "The Monitor - Tracking Report," Portland Cement Association.



The simple fact of the matter is initial cost drives the decision the majority of the time and no matter how many facts or how much research you throw at people, they will not change. First, most folks do not understand your arguments or your research, nor do they really care. To them, right or wrong, it is all about initial costs under whatever system they use for comparison. That is something they can relate to. It seems everybody has respect for the almighty dollar.

Fortunately, in today's economic environment, concrete paving is increasingly becoming less expensive relative to asphalt. Those of us active in promotion are quite familiar with *Figure 1*, a graph published monthly courtesy of Portland Cement Association. The graph depicts the Producer Price Index over the last few years for the major building products against which concrete competes. Of these materials, concrete has remained the most consistent, but more importantly in the paving market, the price of asphalt relative to concrete has increased dramatically.

The reasons for that are beyond the scope of what we can cover here, but certain rules of supply and demand are in play today, both locally and globally, that were not just a few short years ago. These changes are driving up the costs of asphalt relative to concrete and this appears to be a trend likely to continue. Let's look at the implications for concrete pavement based on changes in the price of materials. First, we need a good source of information.

Since about 1992 we have collected bidtabs from the Illinois Department of Transportation that allow us to monitor quantities of pavement constructed of both types, but more importantly for our purposes here it collects the prices bid by the winning bidders for various designs in both products. The database develops rough estimates of weighted average bid price per unit in whatever unit the Department uses for every paving item awarded. The data can also be limited to a certain time period. We can look at what is happening today.

First let's go back to our original premise and the one we left you with in the last issue of the newsletter. If you will recall we made the claim that "…concrete has always been first cost competitive if you can get an equivalent design." Now let's apply

what we know to today's competitive environment using roughly equivalent designs in terms of number of vehicles carried.

Going back to the AASHTO methods using the equations developed at the Road Test done right here in Ottawa, we can develop roughly equivalent sections and adjust these costs approximately to demonstrate our point from our bidtab history. For simplification, we placed the concrete and the asphalt both on a 4-inch granular subbase. (Most engineers that you deal with are adamant that you need it under concrete, in spite of data and performance indicating otherwise for parking lot sections, so take away that argument.) The results follow in two parts: 1) The relative traffic capacity calculation; and 2) The relative costs of the sections.

The relative cost of a roughly equivalent asphalt section today is roughly fifty (50) percent higher to that of the minimum 5-inch concrete pavement section that we normally recommend for traveled lanes in parking lot applications. Indeed, the IDOT minimum section from the Bureau of Local Roads is just a little less expensive, but that section carries roughly 4.5 times as many axle loads as seen in the earlier chart. As long as the ratio of the price of the asphalt section to the concrete is greater than one, concrete is the less expensive alternative. The price of asphalt would have to be about two-thirds that of the concrete section to be competitive if "equivalency" was an actual consideration.

Some of you are probably asking yourself the question, "Is that really true?" After all, even our own industry is sometimes convinced that we cannot compete against asphalt.

In a 2009 concrete overlay project in Logan County, the bid price for a 5¼ -inch structural fiber reinforced concrete overlay works out to be roughly $21.34 per sq. yd. The County's estimate of price for a 5-inch asphalt overlay of the same section at that time worked out to be roughly $22.81. Setting aside the longer life proven in Illinois on concrete overlays, the concrete was cheaper in initial cost than the similar asphalt section!

Being less expensive by whatever standard, that earns respect! We no longer have to be the Rodney Dangerfield of the paving industry!

Randell Riley is the Executive Director/Engineer for Illinois Chapter – ACPA and can be reached at 217-793-4933 or pccman@ilacpa.com.

Tell It Like It Is

By John Albinger

END OF THE CHUTE?

I've talked about responsibility before, specified or contractual - strength, slump, air, temperature - and assumed - workability, placeability, finishability and setting time. Though we like things to be black and white, these responsibilities hardly ever are.

Placement ability is a good example of a "gray" area of responsibility, especially when access is an issue and the concrete has to flow a considerable distance, or the concrete is conveyed or pumped, or there is a lot of reinforcement that the concrete has to get in between and around. Sometimes we hesitate to bring up too many issues when we're negotiating to get a job because we want to keep things as simple as possible, and we may not want to quote special mixes that cost more money or mixes that our competition may not see a need to discuss or quote.

If you haven't talked about placement beforehand you can bet it becomes your problem as soon as the first truck pulls on to the job. All too often water is resorted to as the solution and sometimes it does, in fact, get the concrete to where it's supposed to end up. But what about when the concrete is pumped and reducers, elbows and rubber hoses restrict the flow? Water probably isn't the answer. Too many placement conditions exist that alter the quality of the concrete and what we delivered isn't what ends up in place. ACI says that when concrete is pumped, tests should be run on the concrete as delivered and again at the point of placement. That helps but still doesn't keep us out of a problem. ASTM and ACI also say that if the job specifications differ from industry standards and specifications, the job requirements take precedence. So, contractors, or for that matter engineers, can specify anything they want and that's OK, if we agree that we can give them what they want, like "in place" quality.

So, how do we "cover our butt" and not get into these predicaments? The answer is obvious. As much as you may not want to or feel uncomfortable doing it, raise the issue before you quote the job. Ask, "Are there any special placement considerations?" and "How is the concrete going to be placed?" and "If the concrete is going to be pumped is it going to be tested before and after the pump?" Special placement issues almost always mean mix adjustments or complete redesigns. However, maybe the contractor can think about creating different access routes or different pump configurations that make placement less complicated. If a mix change is the only answer, you might want to involve your admixture provider to get involved in proposing a new mix.

ASTM C-94, 4.1, states, "The basis of purchase shall be a cubic yard or cubic meter of fresh concrete as discharged from the transportation unit." IT AIN'T ALWAYS SO!

Mel Kirchler (r) and John Albinger.

Kirchler Retirement

The Illinois Ready Mixed Concrete Association honored IDOT District One Bureau Chief Mel Kirchler's retirement, which was effective on December 1, 2010. IRMCA's Technical Consultant and longtime friend of Mel's, John Albinger, presented Mel with a plaque thanking him for his many years of service to the concrete industry in Illinois.

Mel Kirchler is a civil engineer who was employed by IDOT for 42 years. He worked as a technician, an area supervisor, a mixture control engineer, and as Bureau Chief. IRMCA wishes Mel and his wife Bernice a wonderful, warm retirement.