acipgh.com
**American Concrete Institute**
**Pittsburgh Area Chapter**
P.O. Box 86
Zelienople, PA 16063

**Spring 2015**

# "Progress Through Knowledge"

## Pittsburgh Area Chapter 2015 Upcoming Events

SOCIAL NIGHT

**Saturday, May 23rd**

ACI GOLF OUTING

**Monday, July 27th**
Quicksilver Golf Club

*Visit our website for a list of upcoming events at www.acipgh.com/calendar.shtml.*

PITTSBURGH AREA CHAPTER
acipgh.com
Spring 2015

# Chapter News

## Low-Cracking High-Performance Concrete Bridge Decks

By David Darwin, Ph.D., P.E., Deane E. Ackers Distinguished Professor and Chair, Dept. of Civil, Environmental & Architectural Engineering, University of Kansas, Past-President of ACI

Research dating back over 25 years has established the key factors that control bridge deck cracking – age, bridge deck type, concrete material properties, site conditions, curing, and even date of construction. An understanding of these factors has been put to good use in a two-phase pooled-fund study under the direction of the Kansas Department of Transportation in conjunction with 18 other state departments of transportation and the Federal Highway Administration.

Figure 1. Pre-cut, rolled, wet burlap is placed within 10 minutes of strike-off.

The specifications for low-cracking high-performance concrete (LC-HPC) involve concrete with increased aggregate content and aggregate size, along with an optimum aggregate gradation to allow the use of concrete with the cement contents of 540 lb/yd3 (320 kg/m3) or less. Water-cement ratios range from 0.43 to 0.45 to help limit high concrete compressive strength. Air contents range from 6.5 to 9.5%, and the designated slump range is 1.5 to 3 in. (40 to 75 mm). Not unexpectedly, one of the challenges has been to get contractors to use slumps in this low range. The temperature of concrete, as delivered to the site, is specified as 55 to 70°F (13 to 21°C).

To limit the cement paste at the surface of the deck, concrete finishing is minimized through the use of a single-drum roller screed (including double-drum roller screeds with one roller immobilized). After concrete placement, fully saturated, presoaked burlap is placed within 10 minutes of strike-off (Figure 1) and kept constantly wet with spray hoses until the concrete has set. Soaker hoses are then placed and the burlap is covered with white plastic. Curing continues for 14 days.

The study, which includes an equal number of control decks constructed using conventional procedures, is summarized in Figure 2, with

.....Article continued on page 2 ►

aci 2014 Excellent Chapter

## Congratulations!

This April, we were recognized at the ACI Convention Opening Session and Awards Program as an Excellent Chapter. This award recognizes chapters that have attained the highest level of achievement in chapter activities. We take exceptional pride in having reached this level of accomplishment.

# President's Message

**By Mark B. Snyder**

Greetings Fellow ACI Members,

As we approach the beginning of the heaviest part of the concrete construction season (and the end of the school year), we draw close to the end of ACI-Pittsburgh Chapter administrative year – no more monthly meetings and newsletters, new officers and board members are installed, awards are made to deserving students and we look forward to our summer social activities, such as the Pirates Game outing on May 23 and the annual Golf Outing on July 27 (contact Beth for tickets/reservations to these events). It is a good time to take stock of the efforts and accomplishments of the Chapter over the last year, and to express thanks to those that made it happen.

We've had another very good year – an excellent year, actually, as we were recognized by ACI International as one of only a handful of "Excellent Chapters" worldwide! One of the reasons for this recognition has to be our exceptional certification program. We had terrific participation in our Certification classes and programs this year, including (for the first time) a Level I Technician class that was offered to student members at the Penn State campus for no charge! Special thanks have to go out to incoming Chapter President Andy Lawrence of J.C. Lee Construction and the many members of his Education and Certification Team for their tireless efforts on behalf of the Chapter and the concrete community in general to give so generously of their time to make these courses happen!

This year also saw tremendous growth and activity in the student Chapter at Penn State University, with the aforementioned certification course and several meetings with technical presentations that were attended by up to 40 students and chapter members. This is due largely to the efforts of Student Chapter President Tom Pochatko, Education Committee Co-Chairs April Snyder and Bill Tate, and the support of several Penn State Civil Engineering Faculty (Farshad Rajibipour, Alexsandra Radlinska and Tom Skibinski) and local ACI members.

I'd like to also acknowledge the efforts of all of the other board members who continue to contribute to the success of the Chapter in ways too numerous to mention in this brief message. And last, but certainly not least, we all recognize the continuing efforts of our Chapter Secretary-Treasurer, Beth Rader, who has been a continuous source of support to the chapter for 13 years now – thanks, Beth!

Have a safe and productive construction season, everyone – see you in the Fall!

Sincerely,

Mark B. Snyder, *2014-2015 Chapter President*

## BOARD OF DIRECTORS

### 2014 ~ 2015

**Russ Smith, Jr.**
Kiefer Coal & Supply Co.
*Past President*

**Mark Snyder**
ACPA Pennsylvania Chapter
*President*

**Andy Lawrence**
JC Lee Construction Company
*Vice President*

**Beth Rader**
*Secretary / Treasurer*

**~ DIRECTORS ~**

| | |
|---|---|
| *Michael Dale* | ALCM |
| *David Farone* | Essroc |
| *Pat Hofmann* | PennDOT |
| *Matt Manning* | J.J. Kennedy, Inc. |
| *Justin Rader* | J.J. Kennedy, Inc. |
| *April Snyder* | RJ Lee Group, Inc. |
| *Bill Tate* | Silhol Builders Supply Company |
| *David Thomas* | Golden Triangle Construction |
| *Nick Wytiaz* | A&A Consultants, Inc. |
| *David Yeske* | 43rd Street Concrete |

**Chapter News is published by the American Concrete Institute, Pittsburgh Area Chapter for the purpose of informing members and others about issues of concern to the concrete industry. If you have information to include in this publication or any comments, contact ACI Pittsburgh Chapter at 724-452-1468**

► Continued from page 1

## Low-Cracking High-Performance Concrete Bridge Decks

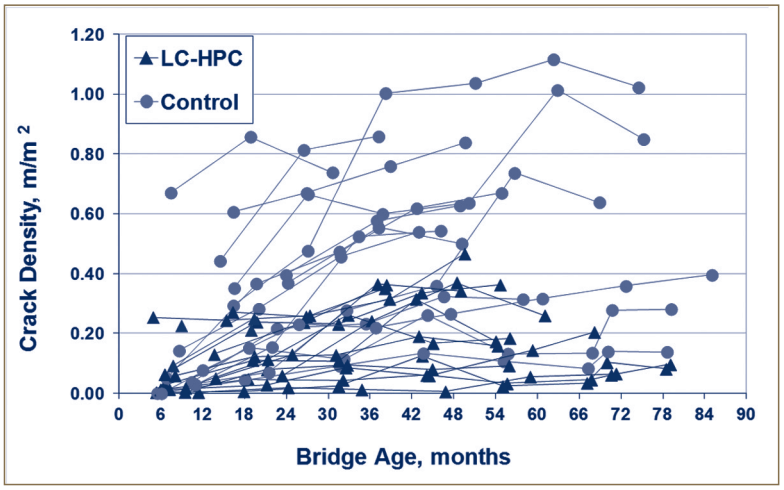


Figure 2. Crack density versus age for LC-HPC and matching control decks.

crack density shown in linear meters per meter of bridge deck versus age. The control decks match the LC-HPC decks based on structure type and traffic loading. The LC-HPC decks have performed far better as a group than the control decks with the LC-HPC decks performing better than the matching control decks in every case. Full comparisons are available at https://iri.drupal.ku.edu/node/43.

**Further Information**

For further information about this project, please contact the author at daved@ku.edu.

## Concrete Field Testing Technician Grade I Class was held February 9-10, 2015 at New Enterprise Stone & Lime in Roaring Spring, PA.

## ACI Library Moved to U-Pitt

The ACI-Pittsburgh Chapter library has been moved from the offices of PCI to Room 731 of Benedum Hall at the University of Pittsburgh in an effort to improve access for ACI members while also making this important resource more readily available to civil engineering students at the University of Pittsburgh.

The library includes copies of hundreds of ACI publications that are of interest to concrete researchers, practitioners and specifiers alike, including the Manual of Concrete Practice (updated annually on CD), most of the entire Special Publication Series, the latest reports and publications by each standing ACI committee, as well as numerous concrete-related publications and slide collections from the Portland Cement Association and other organizations. A complete list of all Chapter library publications and directions for access will be posted on the Chapter website at www.acipgh.com.