



# International Society for Concrete Pavements

Quarterly E-Newsletter  
Vol. 3, No. 1

January 2006

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## CORPORATE MEMBERS



## What's New at ISCP

### Greetings From the President



Best wishes for the new year to all! Year 2005 was a great year for the Society and we plan to continue our efforts to do even more for the membership during 2006. This year will also bring in new leadership to manage the many activities of the Society. As you will recall, the balloting for the officers and the Board was carried out a few months ago. A slate, developed by the Nominating Committee, was recommended and approved by the membership. The following are the officers and board members for the new term, beginning February 1:

President: Dan Zollinger (USA)  
Vice-President: Kathleen Hall (USA)  
Secretary-Treasurer: Mark Snyder (USA)

- |   |  |
|---|--|
| 1. Jamshid Armaghani (USA) - 2 years        | 8. James Grove (USA) - 4 years             |
| 2. Jose Balbo (BRAZIL) - 4 years            | 9. Fred Hejl (USA) - 2 years               |
| 3. Michael Darter (USA) - 4 years           | 10. Andre Jasienski (BELGIUM) - 4 years    |
| 4. Anna-Carin Brink (S.AFRICA) - 4 years    | 11. Gerry Krozel (USA) - 2 years           |
| 5. Neeraj Buch (USA) - 2 years              | 12. Tatsuo Nishizawa (JAPAN) - 2 years     |
| 6. Jean-Pierre Christory (FRANCE) - 4 years | 13. George Vorobieff (AUSTRALIA) - 2 years |
| 7. Juan-Pablo Covarrubias (CHILE) - 4 years | 14. Leif Wathne (USA) - 2 years            |

In addition to the above leadership, we also have many members who serve as liaison to the Board – representing their organizations or their countries. The incoming officers and directors will be installed at the January 2006 Board and Membership meeting. All officers will serve 4-year terms. As shown, seven directors will serve 4-year terms and another seven will serve 2-year terms, in accordance with the board action taken at the August 14, 2005 meeting. I would like to thank the outgoing Directors for their valuable time, support and advise over the last four years. The state of the Society is very good, both financially and in terms of membership. We have a good core membership and are striving hard to increase the core membership and organizational members. During the conference years, our membership swells and the core members continue to renew membership every year thereafter. The society will also be in good hands, under the new leadership of Dan/Katie/Mark and the new Board. Work will continue on initiatives already in progress and we can count on new activities that will make the Society more progressive and more dynamic. We will be discussing many of these items at the next Board and Open meeting and we will be seeking your advise on the these items.

As you have been alerted by Mark and as noted elsewhere in the newsletter, our next Board and Open meeting will be held on Sunday, January 22, 2006 at the Marriott Hotel (Carolina Room) at 5:30 PM, in conjunction with the 85th Annual Meeting of the Transportation Research Board in Washington, DC.

In closing, I would like to thank you all for your continued support of the Society. It has been my good fortune and a pleasure to have served as your President over the last four years. I hope to see most of you on January 22.

Shiraz Tayabji, President, ISCP  
[stayabji@concretepavements.org](mailto:stayabji@concretepavements.org)

## Renew your ISCP Membership Online Now!

This may be your last ISCP newsletter if you haven't renewed your ISCP membership for 2006!

ISCP memberships of all types can now be renewed online using a credit card at <https://www.concretepavements.org/Membership/regrenewal.htm>. This secure, online renewal site offers members the option of prepaying their dues at current rates through 2007, 2008 or 2009 for convenience and to avoid possible rate increases in those years. Receipts are automatically e-mailed for online payments.

All nonmember registrants for the 8<sup>th</sup> International Conference on Concrete Pavements received complimentary membership in ISCP for the remainder of 2005, but must renew that membership now!

Please continue to support ISCP's efforts to further technical education and research in all areas related to concrete pavements – renew your membership online today!

Note: There is a discrepancy in the due dates listed on membership invoices (typically January 1) and the renewal form itself (January 15). Dues are being considered due on January 15 and memberships will lapse on February 15, 2006. ISCP apologizes for the confusion and premature mailing of second notices.

### Annual Meeting and Dinner Reminder

The annual meeting of the ISCP board of directors and membership will be held in the Carolina Room of the Marriott Wardman Park Hotel in Washington, D.C., USA at 5:30 p.m. on Sunday, January 22, 2006. An agenda will be posted on the ISCP website one week before the meeting and will include proposals for the annual budget and international workshop activities, installation of new officers, and discussion of other future ISCP activities.

The meeting will be followed by an optional informal (social) group dinner in the Cedar Room of the [Lebanese Taverna Restaurant](#) at 2641 Connecticut Avenue, NW (across from the Woodley Park Metro Station) from 7:30p – 9:30p. The cost of the dinner to current ISCP members will be about \$10(USD), with the remainder of the cost subsidized by the Society. The reservation deadline for the dinner has been extended to January 16, but remaining space is very limited. *Please reserve your space by e-mail to the secretary-treasurer, Mark Snyder, at [msnyder@concretepavements.org](mailto:msnyder@concretepavements.org).*

### International Journal of Concrete Pavements Vol. 1 No. 1 is out!!!

The inaugural edition of the *International Journal of Concrete Pavements (IJCP)*, the new peer-reviewed electronic journal of ISCP, is now available for viewing at <http://www.concretepavements.org/ijournal.htm>. A table of contents of this first edition, including direct links to the published papers, is listed below.

#### Volume 1, Number 1 – December 2005

<a href="#">Editor's Note</a> .....	pp. i
<a href="#">Call for Papers</a> .....	pp. ii
<a href="#">Improvement of Aggregate Interlock Equation Used in Mechanistic Design Software</a> .....	pp. 1-22
Anna-Carin Brink, Emile Horak, and Alex Visser	
<a href="#">The Effect of Slab Curvature on IRI Values for Jointed Concrete Pavements</a> .....	pp. 23-32
Christopher R. Byrum	
<a href="#">Use of Shear Connectors to Improve Bond in Concrete Overlays</a> .....	pp. 33-47
Dong-Uk Choi, Norbert J. Delatte, David W. Fowler, and James O. Jirsa	

**Special section – award winning papers from the 8th International Conference on Concrete Pavements, Colorado Springs, Colorado, USA**

***Eldon J. Yoder Award for Best Paper***

[Improved Techniques for Assessing Ride Quality in Concrete Pavements](#) ..... pp. 48-65

Hans Prem and Geoff Aytan

***Bengt Friberg Award for Best Paper by a Young Author (2 award winning papers)***

[Large-Scale Airfield Concrete Slab Fatigue Tests](#) ..... pp. 66-87

Jeffery R. Roesler, Jacob E. Hiller, and Paul C. Littleton

[Tire-Pavement Interaction Noise: Recent Research on Concrete Pavement Surface Type and Texture](#) ..... pp. 88-105

Narayanan Neithelath, Rolando Garcia, Jason Weiss, and Jan Olek

***Robert G. Packard Award for Outstanding Paper on Concrete Pavement Design***

[Design and Construction of Seamless on Westlink M7 Sydney, Australia](#) ..... pp. 106-127

Steve Griffiths, Geoff Bowmaker, Chris Bryce, and Russell Bridge

For manuscript guidelines and editorial policies of the IJCP, please go to

[www.concretepavements.org/Membership/ejournalCFP.htm](http://www.concretepavements.org/Membership/ejournalCFP.htm)

Specific questions on the Journal can be directed to [Norb Delatte](#).

**ISCP Welcomes New Member Holcim (US)**



ISCP welcomes Holcim (US) Inc. as one of its newest organizational members and supporters! Holcim (US) is one of the nation's leading manufacturers and suppliers of cement and mineral components. The company has 2400 employees and operates 14 manufacturing plants and over 70 distribution facilities in the United States. Holcim (US) Inc. is a subsidiary of Holcim Ltd, of

Switzerland, one of the world's leading suppliers of cement, aggregates (crushed stone, sand and gravel), concrete and construction-related services.

Holcim Ltd was founded in 1912 in the village of Holderbank in Switzerland. Since that time, the company has grown into a global player that employs more than 61,000 people and maintains a strong market presence in over 70 countries on all continents. Today, the international presence of Holcim consists of a balanced mix of companies in industrialized and emerging markets.

While Holcim's core business continues to focus on the manufacture, distribution and marketing of building materials, Holcim recognizes that there is an accompanying responsibility to tackle the ecological and social issues associated with industrial operations. Holcim is committed to sustainable development through good environmental practices and respectful relations with employees and neighbors.

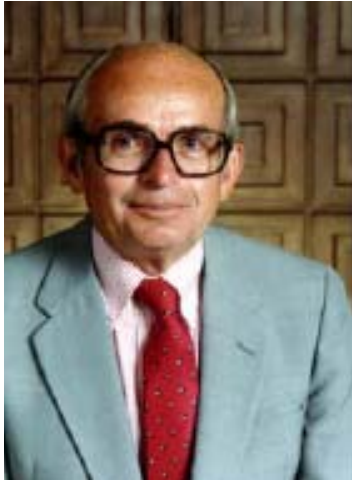
ISCP's member contact for Holcim (US) Inc. is Mr. Peter Deem, Vice-President of National and Regional Promotion, 400 Centennial Parkway, Suite 190, Louisville, CO 80027. Tel. (303) 984-6020.

Members are also encouraged to visit the Holcim website at [www.holcim.com](http://www.holcim.com).

# Honorary Member Feature

As a new feature to the quarterly e-newsletter, ISCP will feature an honorary member to pay tribute to their respective contributions to the field of concrete pavements. The first honorary member to be featured is Gordon Ray, who unfortunately passed away earlier this month.

## **“Dean of Concrete Paving” Gordon Ray Passes Away at Age 86**



Gordon Keith Ray, 86, of Arlington Heights, Illinois, one of the country's best-known paving engineers and an internationally recognized authority on the design and construction of concrete pavements for roads and airport runways, passed away on January 4, 2006.

A registered professional engineer, Mr. Ray was employed by the Portland Cement Association (PCA) for 38 years, directing the Skokie, Ill.-based trade group's paving and transportation department and later the public works division. For many years he also taught courses in pavement design and construction at Purdue University and the University of Wisconsin. His many lectures about the use of concrete and soil-cement earned him the title of “Dean of Concrete Paving.”

As a young civil engineer at PCA, Mr. Ray teamed up with Kansas State University professor Gerald Pickett in 1949 to create the Pickett & Ray Influence Charts, a scientific guide to designing concrete pavements to withstand increasingly heavy modern trucks and aircraft. He confirmed the charts with field-based research and pavement surveys in Illinois and Ohio in 1946 and 1947 and as PCA's observer at the McPherson Test Road in Kansas in 1949 and similar studies in Maryland, Idaho, and Illinois in 1950s.

When this research conclusively demonstrated that concrete pavements outperformed competing asphalt, Mr. Ray and other PCA engineers toured highway departments to promote the use of concrete in the then newly authorized Interstate Highway System and other roads. Mr. Ray traveled to all 50 states, 10 Canadian provinces, and 19 other countries and wrote numerous technical papers to promote concrete pavements to public works agencies, engineering schools, and others. Eventually 65 percent of interstate highways were built of concrete.

Ray's Influence Charts and their successors guided the design of roads and civilian and military airports during much of the postwar construction boom. U.S. and international highway authorities often sought his counsel on concrete pavement technology.

A Fellow of the American Society of Civil Engineers (ASCE), Mr. Ray served on ASCE committees on structural design, construction, maintenance, and operation of roads and runways and on the Permanent International Association of Road Congresses' Technical Committee on Concrete Roads. His contributions to his profession were honored with several awards, including the American Road Builders Association's Paul F. Phelan Memorial Award and the American Concrete Pavement Association's H.W. Hartman Outstanding Achievement Award. The International Society for Concrete Pavements also conferred the status of honorary member to Mr. Ray during the 8<sup>th</sup> International Conference on Concrete Pavements in Colorado Springs, Colorado, USA this past August.

For more than 30 years, Mr. Ray participated in the National Research Council's Highway Research Board. There, he chaired its Steering Committee for the First International Conference on Concrete Pavement Design in 1977 and its successor in 1981. Over time, as traffic and weather led to the need to upgrade and replace roads, Mr. Ray also helped shape the agenda for the Transportation Research Board's National Seminar on PCC Pavement Recycling and Rehabilitation in 1981.

Mr. Ray's enduring interest in concrete pavements extended beyond working hours, according to his daughter Katherine Nelson. “Dad loved to drive the interstates, and it wasn't uncommon for him to pull off a highway on a family vacation to walk along a shoulder inspecting pavement,” Ms. Nelson said. “He would look for symptoms like cracks or scaling in the pavement, and could diagnose whether a stretch of rough or crumbling road was caused by the wrong aggregate, improperly sawed joints, poor design, or some other problem.”

The International Society for Concrete Pavements offers its condolences to Mr. Ray's family and regrets the loss of a great leader in our field.

# Industry Notes

## ACPA Newsletters

### *Concrete Pavement Progress*

The latest issue of the American Concrete Pavement Association is dedicated to Streets & Local Roads. Articles on this topic, plus Products & Services Spotlight, Tech corner and more. Visit <http://www.pavement.com/cpp/2005/CPP-December-05p.htm>

## Recent Publications

### *A Field Verification Instrument to Assess the Placement Accuracy of Dowel Bars and Tie Bars in PCCP*

October 2005, Kansas Department of Transportation

The full report can be obtained from the KDOT Research Reports Catalog at <http://www.ksdot.org/burmatres/kdotlib2.asp#results>



### *Changing the Shape and Location of Pavement Load Transfer Devices* November 2005, in Transportation Research Record 1907

A field research project in Iowa that used two elliptical bars of different sizes at three spacings and numbers of bars per joint is presented in a paper in this TRR.

### *Computer-Based Guidelines for Concrete Pavements Volume II- Design and Construction Guidelines and HIPERPAV II User's Manual*

November 2005, FHWA Report

The report, Volume II of a three-volume set, provides general instructions on the use and application of the HIPERPAV II.

<http://www.tfhr.gov/pavement/pccp/pubs/04122/04122.pdf>



# Research News

## TRB 85th Annual Meeting

Theses are the titles of some of the sessions in this year TRB meeting addressing issues in our industry. For more details visit [www.trb.org](http://www.trb.org)

- Quiet Concrete Pavements: Taking Knowledge to Solutions
- Portland Cement Concrete Pavement Rehabilitation and Maintenance Initiatives
- Portland Cement Concrete Pavement Construction: New Developments (Poster Session)
- Contractors' Perspective on Building Portland Cement Concrete Pavements Through Specifications
- Innovative Construction Techniques from National Concrete Pavement Technology Program
- Mechanistic-Empirical Concrete Pavement Design
- Concrete Mixtures and Interstate Highway System: Past, Present, and Future
- Edge and Corner Phenomena in Concrete Pavements
- Properties and Performance of Materials Used in Joints and Cracks

## 6th International DUT-Workshop on Fundamental Modeling of Design and Performance of Concrete Pavements (formerly the CROW Workshop)

In conjunction with the timing of the [10th International Symposium on Concrete Roads](#), the 6th International DUT-Workshop on Fundamental Modeling of Design and Performance of Concrete Pavements will be held September 15-16, 2006 in Priorij Consendonk, Old-Turnhout, Belgium. This



workshop is being organized by [Delft University of Technology \(DUT\)](#) in cooperation with the [CROW Technology Centre](#) and the Netherlands Cement Industry [ENCI B.V.](#) and [FebelCem](#). The total number of participants will be limited to 40, with a minimum of 30 participants.

The main themes of this workshop include the following:

1. Fundamental modeling of material properties
2. Theoretical models for concrete pavements
3. Theoretical models related to pavement performance
4. Theoretical design of innovative pavement structures

Abstracts are being accepted for review through February 1, 2006. More details on submission of abstracts and papers as well as workshop details can be found at

<http://tinyurl.com/87stb>

## **International Conference on Long-Life Concrete Pavements**

The [Federal Highway Administration](#), [American Association of State Highway and Transportation Officials](#), [American Concrete Pavement Association](#), [Concrete Reinforcing Steel Institute](#), [Illinois Department of Transportation](#), [International Society for Concrete Pavements](#), and the [Portland Cement Association](#) are sponsoring a the International Conference on Long-Life Concrete Pavements to be held October 25-26, 2006 in Chicago, Illinois, USA.

This conference is targeted at pavement, materials, and geotechnical engineering professionals who are involved in various aspects of concrete pavement design, construction, testing and evaluation, and rehabilitation. These professionals include federal, state and municipal engineers; consulting engineers; contractors; materials suppliers; and academia. Implementable design, construction, maintenance, and rehabilitation techniques that result in long-lasting concrete pavements will be the focus of this conference.

Abstracts (one-page) are being accepted for review through March 1, 2006. More details on submission of abstracts and papers as well as conference details can be found at

<http://tinyurl.com/alql5>

## **Featured Thesis Abstract**

Every issue, the ISCP Quarterly E-Newsletter features a recent thesis or dissertation relating to concrete pavements and materials from around the world. Interested individuals should submit their abstract, former university affiliation/advisor, and current position information to [newsletter@concretepavements.org](mailto:newsletter@concretepavements.org). This quarter, we have a featured abstract from Dr. Chul Suh.

### **THE EFFECT OF EARLY OPENING TO TRAFFIC ON FATIGUE LIFE OF CONCRETE PAVEMENTS**

Dr. Chul Suh

Currently working as a Postdoctoral Fellow

University of Texas at Austin

Austin, Texas, USA

Ph.D. in Civil Engineering at University of Texas at Austin (2005)

Thesis Advisors: Professors David W. Fowler and B. Frank McCullough

Concrete pavements are subjected to many traffic-load repetitions prior to achievement of their full design strength. The effect of early opening to traffic on the life of portland cement concrete pavement systems was evaluated using experiments and mathematical model. To quantify the loss of life due to early opening of a rigid pavement system, an appropriate fatigue equation is fundamentally required. A series of laboratory fatigue tests was performed on simply supported beams to develop appropriate fatigue relationships for typical, normal strength Texas paving concrete mixture designs. After completion of the laboratory testing, accelerated fatigue tests on full-scale concrete slabs were performed under constant cyclic loading. The concept of equivalent fatigue life was applied to correct the effect of the different stress ratios between field and

laboratory testing. The laboratory beams and full-scale field slabs showed an almost identical fatigue relationship after the correction for the variance of stress ratio. On the basis of Miner's hypothesis of linear accumulated damage, an analytical model for the numerical simulation for the prediction of the loss of life of a portland cement concrete pavement due to early opening was developed. The numerical simulations were performed for the various assumptions and considerations for field conditions. The current opening criteria used by the Texas Department of Transportation appear to be reasonable based on the sensitivity analysis results.

## Upcoming Events

### **World of Concrete 2006**

January 16-20, 2006 in Las Vegas, Nevada, USA

<http://www.worldofconcrete.com/WOC2006/public/enter.aspx>

### **Transportation Research Board 85<sup>th</sup> Annual Meeting**

January 22-26, 2006 in Washington, DC, USA

<http://www.trb.org/meeting/>

### **2006 T&DI Airfield and Highway Pavement Specialty Conference: Meeting Today's Challenges with Emerging Technologies**

April 30-May 2, 2006, in Atlanta, Georgia, USA

<http://www.asce.org/conferences/pavements2006>

### **ECF 16 - 16th European Conference of Fracture**

July 3-7, 2006 in Alexandroupolis, Greece

<http://ecf16.civil.duth.gr>

### **6th International DUT-Workshop on Fundamental Modeling of Design and Performance of Concrete Pavements (formerly the CROW Workshop)**

September 15-16, 2006 in Priorij Consendonk, Old-Turnhout, Belgium

<http://tinyurl.com/87stb>

### **10th International Symposium on Concrete Roads**

September 18-22, 2006 in Brussels, Belgium

<http://www.concreteroads2006.org/>

### **International Conference on Long-Life Concrete Pavements**

Oct. 25-26, 2006 in Chicago, Illinois, USA

<http://tinyurl.com/alql5>

### **8th International Concrete Conference and Exhibition "Concrete in Hot and Aggressive Environments"**

November 27-29, 2006 in Manama, Kingdom of Bahrain

<http://www.engineer-bh.com/icce/>

### **Transportation Research Board 86<sup>th</sup> Annual Meeting**

January 21-25, 2007 in Washington, DC, USA

<http://www.trb.org/meeting/>

### **Advanced Characterisation of Pavement and Soil Engineering Materials**

June 20-22, 2007 in Athens, Greece

<http://www.3dfem.org>

### **XXII<sup>rd</sup> World Road Congress**

September 17-21, 2007 in Paris, France

<http://www.paris2007.route.equipement.gouv.fr/index.en.html>

### **9th International Conference on Concrete Pavements**

Organized by ISCP

August 2008 at Location to be determined

<http://www.concretepavements.org/>

If you wish to submit an upcoming conference, meeting, or call for papers for the next ISCP quarterly newsletter (April 2006), please contact us at [newsletter@concretepavements.org](mailto:newsletter@concretepavements.org).

The ISCP Quarterly Newsletter is edited and maintained by Jake Hiller and Erwin Kohler. Any suggestions or additions to future newsletters are welcomed at [newsletter@concretepavements.org](mailto:newsletter@concretepavements.org)

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