

Preliminary Technical Program

INTERNATIONAL CONFERENCE ON SUSTAINABLE CONCRETE PAVEMENTS: PRACTICES, CHALLENGES, AND DIRECTIONS

September 15–17, 2010—Sacramento, California



Sustainable Strategies From Raw Material Production to Long-Term Service

ORGANIZED BY

Federal Highway Administration
National Concrete Pavement Technology Center

AND SPONSORED BY

American Association of State Highway and Transportation Officials
American Concrete Institute
American Concrete Pavement Association
California Department of Transportation
California Pavement Preservation Center at California State University, Chico
Cement Association of Canada
Federal Aviation Administration
International Society for Concrete Pavements
Portland Cement Association
Transportation Research Board
University of California Pavement Research Center
University Transportation Center for Materials in Sustainable Transportation
Infrastructure at Michigan Technological University

BACKGROUND

The majority of concrete pavements in the U.S. interstate and primary systems are now being designed to provide a service life of at least 40 years without requiring significant repair or rehabilitation treatments. While these new pavements are being designed and constructed using sound technical know-how, it is not clear that adequate attention is being paid to ensure that they are implemented in a sustainable manner. Best-practices guidance on sustainable practices is not readily available to pavement design engineers, specifiers, and constructors.

Sustainable construction is of recent origin. However, its importance in the future evolution of our civilization cannot be denied. *As resources diminish globally and the environment comes under increasing stress, the adoption of sustainable design and construction practices is an important strategy to meet the needs of the present without compromising the ability of future generations to meet their needs.*

Recently, increasing attention is being paid to balancing the economical needs for infrastructure development and the engineering strategies to be employed with the need for environmental stewardship. With respect to pavement construction, many new terms and phrases have been introduced in the everyday lexicon of concrete pavement and materials technologists—green highways, environmentally responsible solutions, LEED (Leadership in Energy and Environmental Design), life-cycle energy and emissions analysis and assessment, social and environmental benefits, carbon footprint, and ecological footprint.

For concrete pavements, sustainability-related considerations can be introduced at the design and engineering phase, in material selection, during construction, while in service, and ultimately at the end of the pavement's life. *Sustainability-related considerations must be integrated throughout the life cycle of a pavement.* Although there is a strong desire, and in some cases a mandate, to incorporate sustainability considerations in new concrete pavement design and construction and in the management of existing concrete pavements,

procedures and guidelines for doing so are neither widely accepted nor clearly understood.

To provide highway and airport agencies and the industry with the most current information on sustainability considerations for concrete pavements, a 2 1/2-day conference is being organized as a part of technology transfer activities under the Advanced Concrete Pavement Technology (ACPT) Products Program that operates within the Federal Highway Administration (FHWA). The conference will provide an international forum to discuss the sustainable attributes of concrete pavements by presenting existing technologies, emerging research, approaches to measuring energy and environmental impact, user considerations, and international practices and experience. The forum will present improved and innovative processes for achieving sustainable concrete pavements throughout the pavement's life cycle.

PRELIMINARY PROGRAM

The conference program will consist of about 40 peer-reviewed papers and selected invited presentations for the Plenary Session and the practice-oriented forums. Highlights of the conference will be case studies from U.S. and international highway and airport agencies and industry. The tentative technical program is given below.

PROGRAM AT A GLANCE—September 14–17, 2010

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| Tuesday, 14 | <ul style="list-style-type: none">• All-day National Concrete Consortium Meeting• Evening Reception and Exhibit Program |
| Wednesday, 15 | <ul style="list-style-type: none">• Technical Program• Poster Session• Exhibit Program |
| Thursday, 16 | <ul style="list-style-type: none">• Technical Program• Poster Session• Exhibit Program |
| Friday, 17 | <ul style="list-style-type: none">• Technical Program• Conference ends at noon |

PRELIMINARY CONFERENCE TECHNICAL PROGRAM

(Papers listed have been accepted for possible presentation at the conference)

PLENARY SESSION

Sustainable Concrete Pavements: European Practices and Directions, to be announced

Sustainable Concrete Pavements: Japanese Practices and Directions, to be announced

Challenges Confronting Sustainable Practices for Concrete Pavement Design and Construction in Australia—George Vorobieff, Head to Head International, Australia

Sustainable Concrete Pavements: California Practices and Directions, to be announced

DESIGN CONSIDERATIONS

Composite Pavement Systems—A Sustainable Approach for Long-Lasting Concrete Pavements, Shreenath Rao and Michael Darter,

Applied Research Associates

Design and Rehabilitation Strategies for Sustainable Concrete Pavements—H. Thomas Yu and Mark Swanlund, FHWA

Concrete Pavement Thickness and Materials Optimization Design Concepts and Performance—Tom Burnham, Minnesota Department of Transportation

Enhancing Sustainability Through Two-Lift Concrete Pavement Design—Thomas Van Dam, Applied Pavement Technology; Peter Taylor, National Center for Concrete Pavement Technology; Jeop Meijer, The Right Environment

MATERIALS CONSIDERATIONS

Use of Low-CO₂ Portland Limestone Cement for Pavement Construction in Canada—Michael Thomas, University of New Brunswick, and Kevin Cail, Lafarge North America

Preliminary Technical Program continued

Use of Performance Cements (ASTM C 1157) in Colorado and Utah: Laboratory Durability Testing and Field Case Study—Todd S. Laker, Brooke W. Smartz, Holcim; Thomas Van Dam, Applied Pavement Technology

Next Generation Paving Materials Using Mineralized CO₂ Captured From Flue Gas—Cecily Ryan and Terence Holland, Calera Corporation

High Volume Fly Ash: The Application of Internal Curing—Igor De la Varga, Javier Castro, Purdue University; Dale Bentz, National Institute of Standards and Technology; Jason Weiss, Purdue University

Slag Cement Makes Concrete Pavement More Sustainable and Durable—David C. Weber, Slag Cement Association

MIXTURE CONSIDERATIONS

Mixture Proportioning Option for Improving High Volume Fly Ash Concretes—Dale P. Bentz, Chiara F. Ferraris, Max A. Peltz, and John Winpigler, National Institute of Standards and Technology

An IPRF Study: Airfield Pavement Concrete Mix Proportioning, Incorporating Fly Ash as Cementitious Materials—Ahmad Ardani, Chetana Rao, and Dick Stehly, Applied Research Associates

Development of Concrete Mixtures Using Recycled Brick Masonry From Construction Demolition Waste—Tara L. Cavalline and David C. Weggel, University of North Carolina at Charlotte

Durability of a New Generation of Pervious Concrete Mixtures Designed for Roadway Applications—John T. Kevern, University of Missouri—Kansas City; Vernon R. Schaefer, Kejin Wang, Iowa State University; Paul Wiegand, National Concrete Pavement Technology Center

CONSTRUCTION CONSIDERATIONS

Specifications: Barriers to Sustainability?—Lawrence L. Sutter, Michigan Tech Transportation Institute; Thomas Van Dam, Applied Pavement Technology; Emily Lorenz, Prestressed Concrete Institute

Two-Lift Concrete Paving and Exposed Aggregate Concrete Surfaces as Sustainable Practices—Robert Otto Rasmussen, The Transtec Group; Hermann Sommer, Consultant; E. Thomas Cackler, National Concrete Pavement Technology Center; Andrew J. Gisi, Kansas Department of Transportation; Gary J. Fick, Trinity Construction Management Services; Sabrina I. Garber, The Transtec Group

OVERVIEWS

Basic Principles Behind Sustainability for Concrete Pavements—Peter Taylor, National Concrete Pavement Technology Center, and Thomas Van Dam, Applied Pavement Technology

Innovative Sustainable Pavement Solutions—Fares Y. Abdo, Portland Cement Association

Sustainability Opportunities for Concrete Pavements—Jim Grove, Suneel Vanikar, FHWA; Leif Wathne, American Concrete Pavement Association

Sustainability Opportunities With Pavements: Are We Focusing on the Right Stuff?—Leif Wathne, American Concrete Pavement Association

ADVANCED CONCEPTS

Early Performance of an Instrumented Long-Life, Concrete Pavement—Ryan Rohne, Minnesota Department of Transportation

Sustainable Pavement Overlays Using Engineered Cementitious Composites—Michael D. Lepech, Stanford University, and Victor C. Li, University of Michigan

Concrete Containing RAP for Use in Concrete Pavement—Nabil Hossiney, Mang Tia, University of Florida; Michael J. Bergin, Florida Department of Transportation

ECO-EFFICIENCY AND LIFE CYCLE ANALYSIS CONSIDERATIONS

Eco-Efficiency Analysis in Pavements—R. Uribe, A. Ponce, M. G. Candelas, Cemex; M. Pierobonne, BASF-SE; R. Yoder, BASF-MEXICO

Greenroads: A Sustainability Performance Metric for Roadways—Steve Muench, Jeralee Anderson, University of Washington; Tim Bevan, CH2M Hill

A Proven Methodology for Measuring the Environmental Impact of Concrete for Pavements Using Eco-Efficiency Analysis—Mark A. Bury, BASF Construction Chemicals

Environmental Assessment of Long-Life Pavements—Nicholas Santero, University of California, Berkeley; John Harvey, University of California, Davis; Arpad Horvath, University of California, Berkeley

Whole-Life Energy Requirements for Continuously Reinforced Concrete Pavement—Michael N. Plei, Commercial Metals Company

A Parametric Analysis of Life Cycle Assessment for Concrete Pavement Systems—In-Sung Lee, University of California, Davis; Ting Wang, University of California Pavement Research Center; Alissa Kendall, University of California, Davis; John Harvey, University of California Pavement Research Center

POSTER SESSION

The Value of an Innovative Diamond Grinding Configuration—Bernard Igbafen Izevbekhai, Minnesota Department of Transportation

Thickness Design of Sustainable Pervious Concrete Pavements—Robert Rodden, Gerald Voigt, and Andy Gieraltowski, American Concrete Pavement Association

Implementation of Narrow Contraction Joints in Louisiana: A Cost Benefit Analysis Study—Tyson D. Rupnow, Mark Martinez, and Zhongjie Zhang, Louisiana Transportation Research Center

Sustainable Pavement Design and Performance Improved With Internal Curing—Bruce W. Jones and John W. Roberts, Northeast Solite Corporate

FORUM 1—AGENCY PRACTICES AND DIRECTIONS: WHERE? HOW? WHY? (September 15 afternoon)

Sustainable Concrete Pavements—Initiatives in the FHWA Office of Pavement Technology—Sam Tyson and Gina Ahlstrom, FHWA

Sustainable Concrete Pavements—Agency Practices and Directions (reports and case studies from several U.S. and Canadian highway agencies), to be announced

FORUM 2—INDUSTRY INITIATIVES, INNOVATIONS, AND DIRECTIONS (September 16 afternoon)

Reports and case studies of new developments from several industry organizations, to be announced

Preliminary Technical Program continued

Hydraulic Modeling of Fully Permeable Concrete Highway Shoulders for Managing Stormwater Runoff—Lin Chai, Masoud Kayhanian, Jan Hopmans, John Harvey, David Jones, and Hui Li, University of California Pavement Research Center

Using Soybean Oil to Improve the Durability of Concrete Pavements—John T. Kevern, University of Missouri—Kansas City

An Investigation of the Influence of Compaction on Subgrade Permeability and Stiffness for Fully Permeable Pavements—Hui Li, Lin Chai, David Jones, John Harvey, and Masoud Kayhanian, University of California Pavement Research Center

Overview of a Study Into Fully Permeable Concrete Highway Shoulders for Managing Stormwater Runoff—David Jones, John Harvey, and Masoud Kayhanian, University of California Pavement Research Center

Permeability, Strength, and Fatigue Properties for Open-Graded Concrete for Permeable Concrete Pavements—Brock Campbell, Hui

Li, John Harvey, and David Jones, University of California Pavement Research Center

Investigation of Possible Clogging Associated With Pervious Concrete Pavements in Parking Lots—Masoud Kayhanian, Dane Anderson, David Jones, and John Harvey, University of California Pavement Research Center

Incremental Costs and Benefits of Long-Life Concrete Pavement Design Features—Mark B. Snyder, Consultant, and David Van Deusen, Minnesota Department of Transportation

Structural/Hydrologic Design and Maintenance of Permeable Interlocking Concrete Pavement—David R. Smith, Interlocking Concrete Pavement Institute, and William F. Hunt, North Carolina State University

Integrating Structural and Hydrologic Design Considerations in Permeable Pavement—David R. Smith, Interlocking Concrete Pavement Institute

REGISTRATION DETAILS (all fees are in U.S. dollars)*

| | EARLY (by May 31, 2010) | LATE (by July 31, 2010) | VERY LATE (after July 31, 2010) |
|--|------------------------------------|------------------------------------|--|
| General registration | 350 | 400 | 500 |
| Government agencies (U.S. only) and full-time students | 250 | 300 | 400 |
| Authors and academia | 300 | 350 | 450 |
| Spouses | 100 | 150 | 200 |
| Exhibitors (includes one free registration) | 1,500 | 1,750 | 2,000 |

*Fees include Tuesday evening reception; breakfasts on Wednesday, Thursday, and Friday; lunch on Wednesday and Thursday; dinner on Wednesday; and refreshments at breaks.

CONFERENCE HOTEL

The conference will be held at the Hyatt Regency Sacramento (Phone: 1-888-421-1442) in downtown Sacramento, California, right across from the State Capitol grounds. The conference room rate is \$130.00, single or double (per diem rate of \$114.00 or prevailing rate for U.S. government agency employees—Federal, State, and municipality), plus applicable taxes. The group reservation code for the discounted room rate is “2010 Concrete Conference.” Further details will be provided in the next release of this announcement.

CONFERENCE STEERING COMMITTEE

- Shiraz Tayabji, Fugro Consultants, Inc. (Co-Chair)
- Tom Cackler, National Concrete Pavement Technology Center (Co-Chair)
- Gina Ahlstrom, FHWA
- Randall Iwasaki, Caltrans
- Brent Trautman, Missouri Department of Transportation
- Tim Smith, Cement Association of Canada
- Paul Tikalsky, University of Utah
- Sam Tyson, FHWA
- Tom Van Dam, Applied Pavement Technology, Inc.
- Leif Wathne, American Concrete Pavement Association

TECHNICAL PROGRAM SUBCOMMITTEE

Peter Taylor (National Concrete Pavement Technology Center) (Co-Chair), Shiraz Tayabji (Fugro Consultants, Inc.) (Co-Chair), and representatives from FHWA, highway agencies, industry, and academia

FOR MORE INFORMATION AND THE EXHIBITOR PROGRAM, CONTACT:

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FOR CONFERENCE UPDATES, GO TO

<http://www.fhwa.dot.gov/pavement/concrete/2010acptpconf.cfm>

TO REGISTER ONLINE, GO TO

http://registeruo.niu.edu/iebms/wbe/wbe_p1_main.aspx?oc=40&c=WBE4010454

Technology Transfer to Develop and Manage Safer, Smoother, Longer Lasting Concrete Pavements That Incorporate Sustainable Technologies

Much work is in progress to create sustainable concrete pavement technologies that are cost effective and meet the user’s needs for safer, smoother, quieter, and longer lasting pavements.

The findings from these ongoing and completed studies will be disseminated at the conference, and directions for future work will be defined.