



Legacy

The Newsletter of the RMC Research & Education Foundation

Volume 6 Issue 2

2nd Quarter 2010

Did you know:

- That the first deliverables from the new Concrete Sustainability Hub will be released in late August?
- That the Virtual Cement and Concrete Testing Laboratory researchers at NIST are partnering with the researchers at the MIT-CSH?

In This Issue:

Industry Day at MIT	1
Foundation Releases Fuel Consumption/Emissions Study	2
Sustainable Concrete Plant Guidelines Project Enters New Phase	2
Green Highways Partnership Moving Full Steam Ahead	3
Executive Director Named for Concrete Sustainability Hub	3
Coming Down the Pike	3
Concrete Sustainability Conference a Huge Success	4
List of Corporate & Individual Contributors	Ins

From the Chairman

Is that a light at the end of the tunnel that I see? All indications are that, slowly but surely, both the country and the construction industry are starting to rebound. This was evident through the robust attendance and marked enthusiasm at NRMCA's Concrete Sustainability Conference, held in April. Many Foundation-sponsored projects were featured there and the materials available from the Foundation's booth proved extremely popular. You may read a wrap up from the conference on page four.

One of the projects featured at the Concrete Sustainability Conference was the Green Highways Partnership program that the Foundation is working on with the United States Environmental Protection Agency. This important and exciting educational program is moving along swiftly. There is an update on its activities on page three.

The Foundation also received a tremendous response from its release of the new report *Effect of Pavement Type on Fuel Consumption and Emissions in City Driving* and its companion calculator. Unveiled at NRMCA's annual convention this past March, the new report from the University of Texas at Arlington is extremely timely as we approach the summer driving season and as fuel oil prices continue to rise. You may read more about this study and the Foundation's distribution efforts on page two.

Earlier this year, the Foundation also released the final draft of the Sustainable Concrete Plant Guidelines. Now the project is moving into the Pilot Program phase where ready mix producers can put the Guidelines into practice and provide practical feedback before the Guidelines are finalized later this fall. You may read more about this new phase, including how you may participate, on page two.

Activity is churning away at the new Concrete Sustainability Hub (CSH) that the Foundation and the Portland Cement Association established at the Massachusetts Institute of Technology (MIT) last fall. A new executive director was recently named and you may find out more about him on page three. We are also in the midst of preparing for Industry Day at the CSH, scheduled for August 31. Look for more information about that program, where some of the first deliverables from the CSH's inaugural projects will be unveiled, in the coming weeks but please be sure to set that date aside and join us in Cambridge.

It's no secret, with the recent significant investment in the MIT CSH, that aggressive fundraising is one of the Foundation's most important activities. In fact, as a donor to the Foundation, you have likely received a solicitation of some kind in recent weeks. I hope you will join me in renewing your commitment to the Foundation with a new personal or corporate pledge.

Thank you for your continued support. I hope you enjoy this edition of Legacy.

Regards,
Jim Repman
Chairman



Industry Day at the Concrete Sustainability Hub at MIT Tuesday, August 31, 2010

Join the RMC Research & Education Foundation and the Portland Cement Association for Industry Day at MIT! Learn more about the Concrete Sustainability Hub, including information on the first deliverables, meet the researchers and the new Executive Director and find out how these projects will benefit the industry and our communities. Look for more information soon.

Sustainable Concrete Plant Guidelines Project Enters Pilot Program Phase

Earlier this year, the RMC Research & Education Foundation released the final draft of the Sustainable Concrete Plant Guidelines in an effort to seek additional feedback toward improving the document. Now the project is entering its final phase before completion. NRMCA's Lionel Lemay, who assisted West Main Consultants and William Twitty in developing the Guidelines, is working with concrete producers to put the Guidelines into practice through a pilot program.

Participants in the Pilot Program will use the Guidelines to evaluate a minimum of two concrete plants for their level of sustainability. The Pilot Program will be conducted from May 1-July 31. Once the pilot program is completed, the Guidelines will be updated to reflect the experience gained during the pilot phase. The full program will begin in fall of 2010.

Those interested in participating in the pilot program or learning more about the Guidelines and supporting calculators, may participate in one of two upcoming free webinars. One is scheduled on Tuesday, June 1 from 12:00 noon EDT - 1:30p EDT. The other is scheduled for Tuesday, July 6, also from 12:00 noon EDT - 1:30p.

The Sustainable Concrete Plant Guidelines and supporting materials may be downloaded from the Foundation's home page at www.rmc-foundation.org. Additional information about the pilot program may be found at www.nrmca.org/sustainability.

Foundation Releases Fuel Consumption/Emissions Study

In March, the RMC Research & Education Foundation released the final report *Effect of Pavement Type on Fuel Consumption and Emissions in City Driving*, performed at the University of Texas at Arlington (UTA) by Dr. Sia Ardekani and Palinee Sumitsawan. The study demonstrates that the use of concrete pavements over asphalt pavements clearly benefits the environment through decreased fuel consumption and reduced emissions.

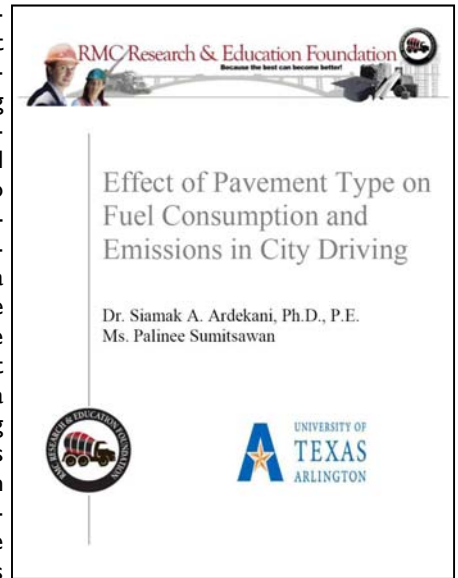
The UTA researchers examined four distinct scenarios on both asphaltic concrete pavement (AC) and Portland cement concrete (PCC) pavement, including constant speed in dry conditions, constant speed in wet conditions, acceleration in dry conditions and acceleration in wet conditions. In every scenario, concrete pavements used less fuel and resulted in reduced emissions and, in some instances, the contrast was stark (see chart below). In fact, overall consumption rates indicate **fuel consumption savings of 3 to 17 percent on PCC pavements**, depending on the driving mode, surface conditions and crown and substructure materials and thicknesses.

Also developed with this project was the tool *Roadway Fuel Consumption and Emissions*

Calculator. This calculator will assist designers and specifiers with quantifying total fuel consumption and anticipated emissions savings so that they may estimate the total carbon footprint of a specific job over the design life of the pavement. This great new tool will go a long way in assisting State Departments of Transportation and local municipalities with making the best possible choices in pavement selection when considering environmental factors.

The release of this study is extremely timely as we approach the summer driving season and as fuel prices once again begin to top the \$3/gallon range. Given the dramatic impact that increased concrete pavement use could have in reducing the country's dependence on foreign oil and the advantages concrete pavements can provide in helping communities reach their air quality goals, wide-ranging distribution of this study's findings is critical. The Foundation is working to spread information on this study around the nation and, to this end, has prepared a one page

summary detailing the study's methodology and findings. This summary, as well as the full study, calculator and the original press release are all available for download from the Foundation's home page at www.rmc-foundation.org. We have also added the study and calculator to the Foundation's popular *Research Supporting Sustainable Development CD*. If you would like copies of the CD or hardcopies of the study, please contact Foundation staff, who are also available to make a presentation on this and the other work of the Foundation to your company or at your local association's membership meeting.



PCC = Portland Cement Concrete AC = Asphaltic Concrete	Fuel Consumed (millions gals/yr)	Total CO ₂ (million metric tons/yr)
PCC, 30 MPH Constant Speed, Dry	3,598	12.7
AC, 30 MPH Constant Speed, Dry	3,775	13.32
PCC, 30 MPH Constant Speed, Wet	4,783	16.88
AC, 30 MPH Constant Speed, Wet	4,942	17.44

Note: These estimates are based on total vehicle miles of travel in the Dallas-Fort Worth region alone.

Green Highways Partnership Moving Full Steam Ahead

One of the many Foundation-supported programs featured at the recent Concrete Sustainability Conference (please see page four) was the Green Highways Partnership (GHP). The presentation was made by Dominique Lueckenhoff, Associate Director of the Water Protection Division of the Environmental Protection Agency's (EPA) Region III. EPA's Region III has a long history of spearheading positive public-private partnerships and the GHP under Ms. Leukenhoff's leadership is no different.

The GHP was established in 2005 by the EPA and the Federal Highway Administration (FHWA) in recognition of the fact that the transportation needs of the public could be met while protecting and sustaining a clean environment at the same time. Some of the goals of the GHP include:

- * Promote *innovation, stewardship, streamlining, and green solutions* for linear environment;
- * Provide *greater incentives for streamlining & environmental stewardship* in transportation; and
- * Promote green technologies for sustainable results – in-

cluding healthy, economically viable communities.

Since the program is voluntary and not regulatory in nature, there is a great deal of incentive for industries to be proactive in the success of this initiative as it will help to better the communities served by all. The increased emphasis on better methods for stormwater management permeate through both government and industry and the establishment of a partnership such as GHP is a natural fit to approach dealing with this issue in the most efficient and effective manner possible.

The area of the Foundation's involvement and support of the program relates specifically to the establishment of the Green Highways Partnership Training and Development Center (GHPTDC). This training and certificate program will address the water quality program and technical needs of the transportation and development industries. It will serve as a national model to help state Departments of Transportation (DOTs), municipal officials, and developers throughout the country to develop strategies for compliance with National Pollutant Discharge

Elimination System (NPDES) and other wet weather regulatory and resource protection programs. There is a need to provide comprehensive training to these groups and consultants on how to address stormwater management challenges balancing the use of traditional, innovative, and green infrastructure approaches (e.g. pervious concrete) that meet regulatory requirements and watershed needs. A partnership with the American Society of Civil Engineers (ASCE) to provide certificate and training credits toward professional education requirements will help to reach an extensive audience with this information. Training is expected to begin in the fall of 2010 and courses will be marketed in cooperation with several industry partners starting in the Mid-Atlantic region.

Additional information about the program may be found at www.greenhighwayspartnership.org.



Executive Director Named for Concrete Sustainability Hub

Hamlin Jennings, who is known among academic and industry researchers for his influential work on the fundamental chemistry of cement, will be the inaugural executive director of the Concrete Sustainability Hub (CSH).

Jennings will leave a tenured faculty position at Northwestern University (NU) to lead the CSH, taking up his new responsibilities at MIT beginning July 1, where he will also hold the position of adjunct professor in MIT's Department of Civil and Environmental Engineering, administrative home of the CSH.

Jennings developed the first fully quantitative model of the nanostructure of calcium silicate hydrate (C-S-H), the major component of hydrated cement. This model formed a basis for quantitatively predicting the mechanical properties of the material and linking these properties to the design of new materials. He currently holds appointments in civil and environmental engineering and in materials science and engineering at NU, and was head of NU's Department of Civil and Environmental Engineering from 2002 to 2006.

Those interested in meeting Mr. Jennings as well as the researchers and graduate students working on CSH projects may do so at the upcoming Industry Day at MIT in Cambridge, MA, on Tuesday, August 31, when deliverables related to the CSH's first projects will be unveiled. More information, including registration information, will be available soon.

Coming Down the Pike – A Calendar of Upcoming Programs and Releases

- * SCC Formwork Pressure Study – Summer 2010
- * Plant Manager Certification – August 17-20, 2010, Silver Spring, MD – visit www.nrmca.org for more information
- * NRMCA's Fall Board of Directors Meeting – September 20-21, 2010, Washington, DC – Foundation to have booth display
- * The Effective RMC Supervisor – September 28-30, 2010, Silver Spring, MD – visit www.nrmca.org for more information
- * Foundation Fundraising Golf Tournament – October 10, 2010, Charlotte, NC, in conjunction with NRMCA's ConcreteWorks
- * NRMCA's ConcreteWorks – October 10-12, 2010, Charlotte, NC – Foundation to have booth display
- * Plant Manager Certification – December 14-17, 2010, Indianapolis, IN – visit www.nrmca.org for more information

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Mission:
To support research
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crease professionalism
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Concrete Sustainability Conference a Huge Success

NRMCA's Concrete Sustainability Conference, held in April in Tempe, AZ, was an unqualified success. The over 200 participants were offered a wealth of choices for the concurrent sessions that included presentations on eight RMC Research & Education Foundation-supported programs over the two-and-a-half-day program.

Since much of the Foundation's work supports sustainable development, it was natural that the program would feature projects such as the Green Highways Partnership (please see page three), the LEED Reference Guide, the Fly Ash Study, the Crushed Concrete Aggregate Study, the Sustainable Concrete Plant Guidelines, the newly-released Fuel Consumption and Emissions

Study, the Virtual Cement and Concrete Testing Laboratory at NIST and the new Concrete Sustainability Hub (CSH) at the Massachusetts Institute of Technology (MIT).

The strong representation of Foundation programs generated a great deal of traffic to the Foundation's booth in the exhibit hall where attendees availed themselves of additional copies of the deliverables CD *Research Supporting Sustainable Development* (also distributed to all attendees in the registration packet) and *Research to Support the P2P Initiative* as well as hardcopies of many of the reports presented at the conference.

The venue also provided the opportunity for researchers, university professors, and professionals around the country,

and in some cases around the world, to share information about current and prospective projects and potential areas of collaboration. This is particularly important in the area of sustainable research. Researchers and graduate students working on projects at the new CSH were especially interested in presentations related to the first two projects underway at MIT - one dealing with the life cycle of concrete and the other on nanoengineering of green concrete.

Next year, the Concrete Sustainability Conference will take place in Cambridge, MA, and will be held in conjunction with the annual Industry Day at the CSH at MIT (this year scheduled for August 31).

Valuable Resources, Tools and Reports Available from the Foundation's Website

Most of the Foundation's completed reports, studies and accompanying tools are available for download from the Foundation's website at www.rmc-foundation.org. Hardcopies of studies, copies on CD and copies of the Foundation's popular compilation deliverables CDs - *Research Supporting Sustainable Development* and *Research to Support the P2P Initiative* - are available by contacting Jennifer LeFevre or Heather Houck at jlefevre@rmc-foundation.org or hhouck@rmc-foundation.org, respectively, or by calling 301-587-1400.



Thanks to all of our contributors. New and increased contributions since the last newsletter have been **bolded**.

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