



INTERNATIONAL
CONCRETE SUSTAINABILITY CONFERENCE
MAY 7 - 10, 2012 - SEATTLE



Improving Concrete Technology
Enhancing the Built Environment



Enhancing your knowledge of sustainability

Welcome to National Ready Mixed Concrete Association's *2012 Concrete Sustainability Conference*. The seventh annual conference will provide the latest advances, technical knowledge, continuing research and solutions for sustainable concrete manufacturing and construction.



In cooperation with:

UNIVERSITY of WASHINGTON

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& CONCRETE ASSOCIATION**

WWW.CONCRETESUSTAINABILITYCONFERENCE.ORG

purpose

The *International Concrete Sustainability Conference* provides learning and networking opportunities on the latest advances, technical knowledge, continuing research, tools and solutions for sustainable concrete manufacturing and construction.



ATTENDEES

Researchers, academics, students, engineers, architects, contractors, concrete producers, public works officials, material suppliers and concrete industry professionals are invited to attend the conference.

PROFESSIONAL DEVELOPMENT

Attendees of the 2012 *International Concrete Sustainability Conference* are eligible to receive up to 15 professional development hours (PDH's), depending on the number of sessions attended. Continuing education forms are available at the registration desk.

topics

Over 60 experts from around the world will present on the latest developments related to design, specifying, manufacturing, testing, construction, maintenance, and research of concrete as it relates to sustainable development.



LIFE CYCLE ASSESSMENT

Methods for assessing carbon footprint, embodied energy and other environmental impacts for buildings, infrastructure, and cement and concrete manufacturing. Life cycle assessment tools and models for process and product innovations and green building.



LOW IMPACT DEVELOPMENT

Sustainable sites including pervious pavements, water conservation systems and erosion control structures. Urban heat island reduction including light colored pavements, exterior cladding, green roofs and cool communities.



GREEN CONCRETE

Recycled materials including ingredients, fuels and beneficial use of byproducts for cement and concrete production. Performance-based concrete including extended service life, performance based specifications, durability, opportunities and challenges.



SUSTAINABILITY INITIATIVES

Government initiatives including green building codes and standards, economic incentives and legislation. Private initiatives including voluntary programs adopted by building owners and developers, designers, contractors and product manufacturers.



FUNCTIONAL RESILIENCE

High performance concrete applications in buildings and infrastructure, fortified building codes and land use, event recovery and sustainable community initiatives focusing on disaster resistance and adaptive reuse potential.



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exhibitors

The 2012 International Concrete Sustainability Conference features an exhibit area where attendees can learn about state-of-the-art products and services for concrete design, manufacturing and construction. Breakfasts, breaks and receptions will be held in the exhibit area throughout the conference. Please be sure to stop by and visit with these progressive companies:

- American Concrete Institute
- Ash Grove Cement Company
- BASF Corporation
- BMH Systems
- Grace Construction Products
- L.M. Scofield Company
- National Ready Mixed Concrete Association
- RMC Research & Education Foundation
- Silica Fume Association

schedule at-a-glance

May 7	Renaissance Seattle Hotel
6:00 pm - 7:00 pm	Opening Reception in Exhibit Area
May 8	Renaissance Seattle Hotel
7:30 am - 8:30 am	Continental Breakfast in Exhibit Area
8:30 am - 10:00 am	Opening General Session G1
10:00 am - 10:30 am	Break in Exhibit Area
10:30 am - 12:00 pm	Concurrent Technical Sessions T1
12:00 pm - 1:30 pm	LUNCH
1:30 pm - 3:00 pm	Concurrent Technical Sessions T2
3:00 pm - 3:30 pm	Break in Exhibit Area
3:30 pm - 5:00 pm	Concurrent Technical Sessions T3
6:00 pm - 7:00 pm	Reception in Exhibit Area
May 9	Renaissance Seattle Hotel
6:30 am - 7:30 am	RMCREF Walk for Sustainability*
7:30 am - 8:30 am	Continental Breakfast in Exhibit Area
8:30 am - 10:00 am	Concurrent Technical Sessions T4
10:00 am - 10:30 am	Break in Exhibit Area
10:30 am - 12:00 pm	Concurrent Technical Sessions T5
12:00 pm - 1:30 pm	LUNCH
1:30 pm - 3:00 pm	Concurrent Technical Sessions T6
3:00 pm - 3:30 pm	Break
3:30 pm - 5:00 pm	General Session G2 (panel discussion)
5:30 pm - 9:30 pm	WACA Annual Awards Reception and Banquet*
May 10	Renaissance Seattle Hotel
7:30 am - 8:30 am	Continental Breakfast in Exhibit Area
8:30 am - 10:00 am	Concurrent Technical Sessions T7
10:00 am - 10:30 am	Break in Exhibit Area
10:30 am - 12:00 pm	Closing General Session G3

* Additional events—see page 7

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*Super Sponsors are those who sponsor all NRMCA events.

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detailed program

MAY 7, 2012

6:00 PM – 7:00 PM: PRE-CONFERENCE RECEPTION (Courtyard Foyer)

MAY 8, 2012

7:30 AM – 8:30 AM: BREAKFAST (Courtyard Foyer)

8:30 AM – 10:00 AM: OPENING GENERAL SESSION G1 (Municipal Ballroom)

- i. **The Concrete Industry's Progress Towards Sustainability**, Dave Robison, President, Delta Industries, Inc. and NRMCA Chairman
- ii. **Building Industry Leadership Demonstrated by the Zero-carbon Cascadia Center in Seattle**, Denis Hayes, president and CEO of Bullitt Foundation, national coordinator of the first Earth Day and honorary chairman of the Earth Day Network
- iii. **Model-based Life-cycle Assessment for Sustainable Engineering Design**, Dr. Franz-Josef Ulm, PhD, George Macomber Professor, Department of Civil and Environmental Engineering at Massachusetts Institute of Technology and director of the MIT Concrete Sustainability Hub

10:00 AM – 10:30 AM BREAK (Courtyard Foyer)

10:30 AM – 12:00 PM: CONCURRENT TECHNICAL SESSIONS T1

- A. GREEN CONCRETE (Municipal Ballroom)
 - i. **Cement and CO₂: Status and Path Forward**, Laurent Barcelo, Manager, Strategic Projects and Scientific Network, Lafarge Technical Center for North and Latin America
 - ii. **Development of Concrete Mixtures with High-Volume Fly Ash Cement Replacement**, Douglas Burke, Subject Matter Expert for Concrete Materials for the Naval Facilities, U.S. Navy
 - iii. **Sustainability of Concrete Structures**, Sidney Mindess, Professor Emeritus, University of British Columbia
- B. LIFE CYCLE ASSESSMENT (Superior Ballroom)
 - i. **Energy Efficiency of Buildings: The Idealized Cube Model**, Alison Ledwith, graduate student, Department of Civil and Environmental Engineering, Massachusetts Institute of Technology
 - ii. **Carbon Accounting Methodologies for Concrete**, Lionel Lemay, Sr. Vice President, Sustainable Development, NRMCA
 - iii. **Infrastructure and Embodied Carbon**, Frances Yang, structures and materials sustainability specialist, Arup

C. SUSTAINABILITY INITIATIVES (Federal Ballroom)

- i. **The Role of Multi-disciplinary Research for Advancing Sustainable Concrete**, Michael Henry, Assistant Professor, Hokkaido University
- ii. **Concrete's Role in Sustainable Development for National Accounts**, Amanda Hult, Director of Pavement Structures, NRMCA and Amy Miller, Senior National Resource Director, NRMCA
- iii. **Legislating Sustainable Pavements**, Timothy Kuebler, Senior Vice President, Cement and Aggregates, Titan America

12:00 PM – 1:30 PM: LUNCH (Madison Ballroom)

1:30 PM – 3:00 PM: CONCURRENT TECHNICAL SESSIONS T2

- A. GREEN CONCRETE (Municipal Ballroom)
 - i. **Strain Hardening Cementitious Composites for Sustainable Infrastructure**, Michael Lepech, Assistant Professor, Department of Civil and Environmental Engineering, Stanford University
 - ii. **Carbon Footprint of High Performance Versus Conventional Vibrated Concrete**, Olafur Wallevik, Head of Basic Research, Innovation Center Iceland
 - iii. **Optimizing Concrete Mixtures for Performance and Sustainability**, Karthik Obla, PhD, PE, Vice President, Technical Services, NRMCA
- B. LIFE CYCLE ASSESSMENT (Superior Ballroom)
 - i. **Project Emissions Estimator (PE-2): A Project Based Approach to Assess Pavement Life Cycle GHG Emissions**, Amlan Mukherjee, Associate Professor, Civil and Environmental Engineering, Michigan Technological University
 - ii. **Robust Life Cycle Cost Assessment (LCCA) of Concrete Pavements by Incorporating Uncertainty**, Omar Sweil, Research Assistant, Civil Engineering, Massachusetts Institute of Technology
 - iii. **Incorporating Uncertainty into the Life Cycle Assessment of Concrete Pavements**, Margaret Wildnauer, Research Assistant, Department of Civil and Environmental Engineering, Massachusetts Institute of Technology
- C. SUSTAINABILITY INITIATIVES (Federal Ballroom)
 - i. **A Futuristic Perspective on Fly Ash**, Keith Bargaheiser, National Manager of CCP Utilization, Headwaters Resources
 - ii. **Sustainability – A Practical Approach for Concrete Producers**, Doug Ruhlin, President, Resource Management Associates
 - iii. **Concrete Delivery Optimization**, James Shilstone, Jr., Concrete Technology Consultant, Command Alkon



3:00 PM – 3:30 PM: BREAK (Courtyard Foyer)

3:30 PM – 5:00 PM: CONCURRENT TECHNICAL SESSIONS T3

- A. GREEN CONCRETE (Municipal Ballroom)
 - i. **Evaluation of High-Volume Fly Ash (HVFA) Concrete Mixtures (Paste and Mortar Components) Using Dynamic Shear Rheometer (DSR) and Isothermal Calorimeter (Interim Results)**, Ahmad Ardani, Manager, Concrete Laboratories, Turner-Faribanks Highway Research Center, Federal Highway Administration
 - ii. **Green Concrete Design Incorporating Life Cycle Assessment and Service Life Prediction and the Effect of Lowering the Carbon Footprint with High Performance Concrete**, Eckert Bühler, Engineering Services, Norchem, Inc.
 - iii. **High Volume Cement Replacement in Ternary SCC Mixes for Composite Construction**, Katherine Kuder, Associate Professor, Department of Civil and Environmental Engineering, Seattle University
- B. FUNCTIONAL RESILIENCE (Superior Ballroom)
 - i. **Use of Alternative Fuel Concrete Trucks in Construction**, Norbert J. Delatte, Jr., Professor and Chair of the Department of Civil and Environmental Engineering, Cleveland State University
 - ii. **Strategies for Sustainable Buildings: Design and Construction**, Mohamed Mahgoub, Assistant Professor and Director of the Concrete Industry Management Program, Department of Engineering Technology, New Jersey Institute of Technology
 - iii. **Resilience: Essential for Sustainability**, Tien Peng, Senior Director of Sustainability, Codes and Standards, NRMCA
- C. LOW IMPACT DEVELOPMENT (Federal Ballroom)
 - i. **Winter Performance of Pervious Concrete in the West**, Ashraful Alam, PhD student, Washington State University and Liv Haselbach, Associate Professor, Department of Civil and Environmental Engineering, Washington State University
 - ii. **Energy Benefits of Porosity Distributions in Pervious Concrete**, Liv Haselbach, Associate Professor, Department of Civil and Environmental Engineering, Washington State University
 - iii. **High Volume Slag Substitution in Pervious Concrete**, Alan Sparkman, LEED AP, Executive Director, Tennessee Concrete Association

6:00 PM – 7:00 PM: RECEPTION (Courtyard Foyer)

MAY 9, 2012

6:00 AM – 6:30 AM: Registration for Walk for Sustainability* (Hotel Lobby)

6:30 AM – 7:30 AM: RMC Research & Education Foundation Walk for Sustainability*

7:30 AM – 8:30 AM: BREAKFAST (Courtyard Foyer)

8:30 AM – 10:00 AM: CONCURRENT TECHNICAL SESSIONS T4

- A. GREEN CONCRETE (Municipal Ballroom)
 - i. **Durability of Portland Limestone Cement**, Bruce Blair, Vice President of Product Performance and Marketing, Cement Division, Lafarge North America
 - ii. **Synergies of Portland-Limestone Cements and Their Potential for Concrete Performance Enhancement**, Tim Cost, Holcim, Inc.
 - iii. **Early Age Shrinkage and Cracking Potential in Portland Limestone Cements**, Jason Weiss, PhD, Professor, Civil Engineering and Director of the Pankow Materials Laboratory, Purdue University
- B. LIFE CYCLE ASSESSMENT (Superior Ballroom)
 - i. **The Same Thing Only Different—Consistent Approaches to Sustainability**, Barry Descheneaux, Manager, Product Support and Development, Holcim, Inc.
 - ii. **Precast/Prestressed Concrete Institute (PCI) Life Cycle Assessment Study**, Dean Frank, Director of Quality and Sustainability Programs, Precast/Prestressed Concrete Institute
 - iii. **Local Sourcing for Green Building: How Homegrown Materials Can Reduce Your Carbon Footprint**, Michael Keinath, Senior Manager, Air Sciences Practice, ENVIRON
- C. LOW IMPACT DEVELOPMENT (Federal Ballroom)
 - i. **Targeting 100! Re-Envisioning Healthcare's Footprint**, Heather Burpee, Research Assistant Professor, University of Washington
 - ii. **Concrete-Filled Tubes with High-Volume Cement Replacement Concrete for Structural Sustainability**, Dawn Lehman, Associate Professor, Structural Engineering and Mechanics, University of Washington
 - iii. **Concrete That Cools the Air**, Gordon Singletary, Special Products Manager, S & W Ready Mix Concrete / Titan America

10:00 AM – 10:30 AM BREAK (Courtyard Foyer)

detailed program

10:30 AM – 12:00 PM: CONCURRENT TECHNICAL SESSIONS T5

A. GREEN CONCRETE (Municipal Ballroom)

- i. **Alkali-Silica Reaction in Concrete Made With Recycled Concrete Aggregates**, Matthew Adams, PhD student, Oregon State University
- ii. **Use of Brick Masonry from Construction and Demolition Waste as Recycled Aggregate in Concrete**, Tara Cavalline, Faculty Associate, Department of Engineering Technology and Construction Management, University of North Carolina, Charlotte
- iii. **Properties of Concrete Containing Recycled Asphalt Pavement**, Nabil Hossiney, PhD Student, University of Florida

B. LIFE CYCLE ASSESSMENT (Superior Ballroom)

- i. **Creating Value from Sustainability: The Role of EPDs and PCRs**, Nicholas Santero, Senior Consultant, PE INTERNATIONAL
- ii. **Concrete Product Category Rules: Technical Details and Industry Implementation**, Kathrina Simonen, Assistant Professor, Department of Architecture, University of Washington
- iii. **Quantifying the Real vs. Methodological Variability in Embodied Carbon Footprints**, Frances Yang, structures and materials sustainability specialist, Arup

C. LOW IMPACT DEVELOPMENT (Federal Ballroom)

- i. **Stoichiometric Carbon Absorption Benefits of Concrete Pavement Surfaces**, Liv Haselbach, Associate Professor, Department of Civil and Environmental Engineering, Washington State University
- ii. **Effects of Surface Treatments on Carbonation Rates of Fly Ash Concrete**, Laura Sullivan-Green, Assistant Professor, San Jose State University
- iii. **Sustainability Opportunities with Pavements: Are we Focusing on the Right Things?**, Leif Wathne, Vice President of Highways and Federal Affairs, American Concrete Pavement Association

12:00 PM – 1:30 PM: LUNCH (Madison Ballroom)

1:30 PM – 3:00 PM: CONCURRENT TECHNICAL SESSION T6

A. GREEN CONCRETE (Municipal Ballroom)

- i. **Concrete's Contribution to LEED 2012**, Tien Peng, Senior Director of Sustainability, Codes and Standards, NRMCA
- ii. **Characterizing Waste Concrete Fines for Incorporation into Ready-Mixed Concrete**, Donald Janssen, Associate Professor, Construction Materials, University of Washington

iii. **Recycled Carpet Fiber Reinforced Concrete with Recycled Concrete Aggregate**, Ashley Kotwal, Graduate Assistant, Department of Engineering Technology, Texas State University

B. FUNCTIONAL RESILIENCE (Superior Ballroom)

- i. **Embodied Carbon and the Case for Longevity**, Donald Davies, Magnusson Klemencic Associates
- ii. **Biomimicry: Learning from Nature for Sustainable Design and Construction Innovation**, Alexandra Ramsden, Leader of the Sustainability Studio, Rushing
- iii. **Advancing Concepts of Sustainable and Resilient Infrastructure**, Dennis Schrader, URS Corp and David Shepherd, Portland Cement Association

C. LOW IMPACT DEVELOPMENT (Federal Ballroom)

- i. **Sustainability Initiatives in the Middle East**, Rabih Fakhri, Managing Director, Grey Matters Consultancy
- ii. **Finite Element Analysis of Porosity and Stress in Pervious Concrete Pavement Systems**, Ashraf Al Alam, PhD student, Washington State University
- iii. **Porous Pavements, Stormwater Infiltration and Clay Soils—From Research to Regulation**, Christopher Estes, President, Estes Design, Inc.

3:00 PM – 3:30 PM: BREAK (Courtyard Foyer)

3:30 PM – 5:00 PM: PANEL DISCUSSION GENERAL SESSION G2 (Municipal Ballroom)

Are Sustainability Codes, Standards and Rating Systems Making a Difference? Renowned panelists will discuss whether or not the proliferation of new codes, standards and rating systems are actually making a difference in the way we construct our buildings and infrastructure projects. Is the environmental impact of our built environments actually being reduced? Are the codes, standards and rating systems focused on the right things? Are designers focused on the right things? Are there better ways to measure sustainability? Are owners willing to pay more for green buildings and infrastructure? Is there enough motivation for designers, owners and governments to build green? These are some of the questions that will be discussed during this informative panel discussion. Audience members are encouraged to participate with questions and opinions.

5:30 PM – 6:30 PM: WACA ANNUAL BUILDING AWARDS RECEPTION** (Maxwell's Restaurant)

6:30 PM – 9:30 PM: WACA ANNUAL BUILDING AWARDS BANQUET** (Madison Ballroom)



MAY 10, 2012

7:30 AM – 8:30 AM: BREAKFAST (Courtyard Foyer)

8:30 AM – 10:00 AM: CONCURRENT TECHNICAL SESSIONS T7

A. GREEN CONCRETE (Municipal Ballroom)

- i. **Recycling Concrete for Sustainable Construction**, Norbert J. Delatte, Jr., Professor and Chair of the Department of Civil and Environmental Engineering, Cleveland State University
- ii. **Long-term Drying Shrinkage Properties for up to 2 Years of Beams with Medium-quality Recycled Coarse Aggregate in the Japanese Industrial Standards**, Noritaka Morohashi, Professor, Department of Architecture and Architectural Engineering, College of Industrial Technology, Nihon University
- iii. **Electrical Resistivity (Conductivity) Testing as a Rapid Durability Index: Discussion of Important Testing Concepts**, Jason Weiss, PhD, Professor, Civil Engineering and Director of the Pankow Materials Laboratory, Purdue University

B. GREEN CONCRETE (Superior Ballroom)

- i. **The Ultimate Toolbox for Specifying Sustainable Concrete**, Mark Bury, Product Manager, BASF Corporation and David Green, eco-efficiency analyst, BASF Corporation
- ii. **Green Concrete Using 100% Fly Ash Based Hydraulic Binder**, Raj Patel, Director of Engineering Research, CeraTech Inc.
- iii. **Assessing the Cleanliness of Manufactured Aggregates using the Methylene Blue Test**, Nathan Tregger, PhD, Research and Development Engineer, WR Grace

C. SUSTAINABILITY INITIATIVES (Federal Ballroom)

- i. **The Greenroads Rating System: Insights from over 100 Case Study Projects on the State-of-the-Practice for Roadway Sustainability**, Jeralee Anderson, Ph.D. Student, Department of Civil and Environmental Engineering, University of Washington, and director of the Greenroads Foundation
- ii. **Bridging the Gap: Solving the Problem between Sustainability in Practice and Concrete Design in Education**, Richard S. Szecsy, PhD., PE, President & CEO of Texas Aggregates and Concrete Association
- iii. **Tool for Generation of EPDs in the Norwegian Concrete Industry**, Mie Vold, Ostfold Research

10:00 AM – 10:30 AM: BREAK (Courtyard Foyer)

10:30 AM – 12:00 PM: CLOSING GENERAL SESSION G3 (Municipal Ballroom)

- i. **A Pathway to Sustainable Concrete: How Industry Programs are Helping Transform the Concrete Industry**, Don Ingerson, Vice President of Sales and Marketing, Titan America, and chairman of the NRMCA Sustainability Committee.
- ii. **Developing Design Codes for Sustainable Concrete—Perspectives from Europe**, Michael Lepech, Assistant Professor, Department of Civil and Environmental Engineering, Stanford University
- iii. **Environmental Product Declarations: U.S. Policy, Driver and Implications for the Concrete Industry**, Kathrina Simonen, Assistant Professor, Department of Architecture, University of Washington

12:00 PM: END OF CONFERENCE

*The RMC Research & Education Foundation is hosting the 2nd annual Walk for Sustainability charity event May 9 from 6:30-7:30 AM. This event raises money for the foundation to meet its goal of helping further the concrete industry through research and education. Participants are asked to gather pledges for walking through Seattle on a specific route, starting and ending at the Renaissance Seattle Hotel. This event requires an additional fee. Visit www.rmc-foundation.org for more detail and to register or visit the RMC Research & Education Foundation exhibit at the conference.



**The Washington Aggregates & Concrete Association is holding its Annual Excellence in Concrete Awards May 9 from 5:30-9:30 PM at the Renaissance Seattle Hotel in conjunction with the conference. Conference attendees are invited to attend. An additional fee is required. Visit www.washingtonconcrete.org/events/current-awards for additional details and to register or visit the NRMCA registration desk at the conference.





future NRMCA events



Join the National Ready Mixed Concrete Association for the 2012 ConcreteWorks conference, September 16-19, 2012 at the Gaylord National Resort, National Harbor, Maryland. NRMCA's ConcreteWorks and Board of Directors Meeting brings together long-standing NRMCA education programs geared toward operations, environmental and safety, business administration, HR, and IT, and adds concrete promotion and sales, sustainability and concrete technology programming to become the "must-attend" event for the concrete industry. Add to this the strategic sessions for NRMCA's Board of Directors, the Expo showcasing the latest industry equipment, technologies and services, and the annual National Mixer Driver Championship, and there is something here for everyone!



Join the National Ready Mixed Concrete Association and Grey Matters Consultancy for the 2012 *International Concrete Technology Forum*, December 12-13, in Doha, Qatar. The conference brings researchers and practitioners together to discuss the latest advances, technical knowledge, continuing research, tools, testing and specifications for concrete. Researchers, engineers, architects, contractors, concrete producers, government officials, material suppliers and concrete industry professionals are invited to present and attend the conference.



NRMCA, based in Silver Spring, Maryland, represents the producers of ready mixed concrete and the companies that provide materials, equipment and support to the industry. It conducts education, training, promotion, research, engineering, safety, environmental, technological, lobbying and regulatory programs.