Sponsored by:
ASTM Committee D-18 on Soil and Rock, and its Subcommittee D18.14 on Geotechnics of Sustainable Construction

Symposium Chair: Tuncer B. Edil
University of Wisconsin-Madison
Recycled materials Resource Center
Madison, Wisconsin, USA

Symposium Co-Chair: Craig H. Benson
University of Wisconsin-Madison
Recycled Materials Resource Center
Madison, Wisconsin, USA

WEDNESDAY, FEBRUARY 2, 2011

9:00 a.m.
Welcome and Opening Remarks
T. Edil, Symposium Chair, Recycled Materials Resource Center, University of Wisconsin-Madison

Invited Lecture:
Importance of Recycled Materials in Highway Construction-FHWA Perspective
S. Nichols, Office of Pavement Technology, FHWA

10:00 a.m.
BREAK

SESSION I: RECYCLED ASPHALT PAVEMENT

Session Chair: A. Gomes Correia
University of Minho
Guimares, Portugal

10:15 am
Full-Depth Reclamation for Recycling Failed Flexible Pavements
W. Adaska

Performance-Related Aggregate Testing Protocol for Sustainable Design of Recycled Pavements
A. Saeed, R. Ashtiani and R. Boudreau
Quality Base Material Produced Using Full Depth Reclamation on Existing Asphalt Pavement

11:00 a.m.   BREAK

SESSION II:  RECYCLED AGGREGATES FOR PAVEMENT LAYERS-1

Session Chair:   E. Tutumluer
University of Illinois
Urbana-Champaign, IL

11:15 a.m.
Influence of Recovery Processes on Properties of Binders and Aggregates Recovered from Recycled Asphalt Pavement
Z. Hossain, P. Solanki, M. Zaman, S. Lewis, and K. Hobson

Evaluation of Particle Shape and Surface Texture of Recycled Organic Aggregates
C. Pierce and L. Brown II

Evaluation of the Effects of Climatic Conditions on Modulus of Base Materials with Recycled Asphalt Pavement
H. Wen, M. Wu, and J. Uhlmeyer

Australian Specifications for Recycled Concrete Aggregate for Pavement Construction
A. Gabr, D. Cameron, B. Andrews, and P. Mitchell

12:00 Noon
LUNCH (On Your Own)

SESSION III:  RECYCLED AGGREGATES FOR PAVEMENT LAYERS-2

Session Chair:   H. Wen
Washington State University
Pullman, WA

1:30 pm
Characterization of Building Derived Concrete Debris For Use in Highway Construction
J. Melton

Sustainable Use of Oil Sands for Geotechnical Construction and Road Building
J. J. Anochie-Boateng and E. Tutumluer

Resilient Characteristics of Bottom Ash and Bottom Ash-Soil Mixtures
H. Titi
Use of Ferrochromium Slag as an Artificial Aggregate in Pavement Layers
A. Yilmaz and M. Karasahin

An Evaluation of Reclaimed Asphalt Shingles for Beneficial Reuse in Roadway Construction
J. Warner and T. Edil

2:45 p.m.    BREAK

SESSION V: RECYCLED MATERIALS IN STRUCTURAL FILL

Session Chair: K. Yasuhara
Ibaraki University
Ibaraki, Japan

3:00 p.m.
Evaluation of Newly Developed Pilot Scale Soil Washing Equipment for Dredged Material for Recycling
J. Park

Use of Recycled Asphalt Shingles Mixed with Granular recycled Materials for Use as Structural Fill
A. Soleimanbeigi, T. Edil, and C. H. Benson

Pelletizing Powder Wastes for Geotechnical Applications
G. Baykal

3:45 p.m.    BREAK

SESSION VI: MATERIAL EVALUATION

Session Chair: J. Park
Seoul National University
Seoul, Korea

4:00 p.m.
Case Study to Promote the Use of Industrial Byproducts: The Relevance of Performance Tests
A. Gomez-Correia

Qualification Tests of Hydraulic Mechanically Stabilized Slag for Base Course Material of Airport Runway Pavement
L. Li
Testing the Ammonia Content of Two Sources of Fly Ash  
S. Butler

Characteristics of a Coal Fly Ash Subjected to Additional Processing  
C. Swan and C. Neil

5:00 p.m.    Symposium adjourns for the day

6:00 p.m.    RECEPTION (Cash Bar)

THURSDAY, FEBRUARY 3, 2011

9:00 a.m.    Opening Remarks
C. H. Benson, Symposium Co-Chair, Recycled Materials Resource Center, University of Wisconsin-Madison

Invited Lecture:  
Development of the EPA Leaching Environmental Assessment Framework (LEAF) and Use of Geochemical Speciation Modeling for Environmental Assessment  
David Kosson, Vanderbilt University, Nashville, TN, USA

10:00 a.m.    BREAK

SESSION VII: ENVIRONMENTAL AND CHEMICAL ASSESSMENT

Session Chair: C. Benson  
University of Wisconsin-Madison  
Madison, WI

10:15 a.m.    Leaching of Zinc and Aluminum from Soils Stabilized with High Carbon Fly Ash  
B. Cetin and A. Aydilek

Groundwater Impacts from Leaching of Coal Combustion Products in Roadway Embankment Construction  
L. Li, B. Peng, F. Santos, Y. Li, and F. Amini

Leaching Behavior of Fluorine from Stabilized Soil with Recycled Gypsum from Plaster Board  
H. Sakanakura, K. Endo, and Y. Inoue

11:00 a.m.    BREAK
SESSION VIII: COMBUSTION PRODUCTS

Session Chair: A. Aydilek
University of Maryland
College Park, MD

11:15 a.m.
**Long-Term Performance Assessment of Class C Fly Ash Stabilized Class F Fly Ash as Pavement Base**
H. Wen and B. Ramme

**Full Depth Reclamation of Asphalt Pavements Using Coal Combustion Byproducts**
T. Butalia, W. Wolfe, and J. Kirch

**Dechlorination of Municipal Solid Waste Incineration Residues for Beneficial Reuse as a Resource for Cement**
T. Shimaoka, T. Komiya, F. Takahashi, and H. Nakayama

12:00 Noon
LUNCH (On Your Own)

SESSION IX: STABILIZATION USING BYPRODUCTS

Session Chair: L. Li
Jackson State University
Jackson, MS

1:30 pm
**Laboratory and Field Evaluation of Cement-Treated RAP Blends as Roadway Base Materials**
D. Yuan and S. Nazarian

**Sawdust Ash Stabilization of Reclaimed Asphalt Pavement**
K. Osinubi, J. Edeh, and W. Onaja

**A Systematic Approach to Clay Stabilization Using Fly Ash**
M. Chrysochoou

**Using Ground Granulated Blast Furnace Slag (GGBFS) with Seawater as Soil Additives in Lime-Clay Stabilization**
A. Kavak, G. Bilgen, and O. Capar

**Fundamental Geotechnical Characteristics of Cement Treat Granulate Soil**
P. Dong, K. Hayano, H. Takahashi, and Y. Morikawa

2:45 p.m. BREAK
SESSION XI: TIRE-DERIVED AGGREGATES

Session Chair: N. Yesiller
Global Waste Research Institute
San Luis Obispo, CA

3:00 pm
Tire Chip Application for Mitigating Earthquake-Induced Instability of Quay Walls
K. Yasuhara, S. Miyota, H. Komine, S. Murakami, M. Hyodo, H. Hazarika,

Lateral Pressure Generated on Retaining Structures with Recycled Tire Aggregate Backfill
M. Pando, M. Garcia-Theran, H. Celis, and T. Abdoun

Use of Tire Shred-Sand Mixture as Backfill in Mechanically-Stabilized Earth Wall Construction in Indiana
M. Smadi, N. Siddiki, and M. Prezzi

Behavior of Sand/Rubber Mixtures: Effect of Rubber Content and Duration of Confinement on Small-Strain Modulus and Damping Ratio
K. Pitilakis, K. Senetakis, A. Anastasiadis, C. Gargala, and I. Karakasi

Dynamic Behavior of Sand/Rubber Mixtures: Effect of Rubber Content on G/G_o-γ-D_T Curves and Volumetric Threshold Strain
A. Anastasiadis, K. Senetakis, A. Souli, and K. Pitilakis

4:15 p.m. BREAK

SESSION XII: RECYCLED POLYMERS, PLASTICS and OTHER MATERIALS

Session Chair: J. Harrington
Federal Highway Administration
Washington D.C.

4:30 a.m.
Sustainable Piling Made of Recycled Polymers, State of The Art Review
M. Iskander

Creep of Reinforced Polymeric Piling
A. Bozorg-Haddad and M. Iskander

Retaining Wall Blocks from Recycled Mixed Glass and Plastic – J. Meegoda

5:15 p.m. Symposium Adjourns for the Day

7:00 p.m. Symposium Banquet (Cash Bar)
FRIDAY, FEBRUARY 4, 2011

9:00 a.m.
**Opening Remarks**
J. Melton, Recycled Materials Resource Center, University of New Hampshire

Invited Lecture:
**Life Cycle Perspectives of Recycled Materials Use in Civil Engineering**
Kevin Gardner, Recycled Materials Resource Center, The University of New Hampshire, Durham, NH

10:00 a.m.   BREAK

**SESSION XIII: BOUND MATERIALS**

Session Chair: J. L. Hanson  
California Polytechnical University  
San Luis Obispo, CA

10:15 a.m.
**Moisture and Rutting Resistances of Foamed Asphalt Mixtures Containing Recycled Coal Ash and Shingles with Moist Aggregates**  
V.S. Punith, F. Xiao, and S. Amirkhanian

**Moisture Susceptibility of Polymerized Stone Matrix Asphalt Mixtures using Warm Mix Asphalt Technologies using Moist Aggregates**  
V.S. Punith, F. Xiao, and S. Amirkhanian

**Laboratory Performance Evaluation of Hot Mix Asphalt Mixes with RAP**  
D. Singh, M. Zaman, and S. Commuri

11:00 a.m.   BREAK

**SESSION XIV: NOVEL RECYCLED MATERIALS**

Session Chair: T. Butalia  
Ohio State University  
Columbus, OH

11:15 a.m.
**Use of Post-Consumer Corrugated Board as Fine Aggregate Replacement in Controlled Low Strength Materials**  
J. Hanson
Rice Husk Stabilization of Reclaimed Asphalt Pavement
K. Osinubi, J. Edeh, and J. Agada

11:45 p.m.
Symposium Summary
C. Benson and Tuncer Edil, Symposium Co-Chairs

Session Chair: H. Titi
University of Wisconsin-Milwaukee
Milwaukee, WI

12:15 p.m. SYMPOSIUM ADJOURNS