Eight International Conference on the

Bearing Capacity of Roads, Railways and Airfields

The University of Illinois at Urbana-Champaign
June 29-July 2, 2009, Champaign, Illinois, USA

Conference Technical Program
Day 1 - Tuesday, June 30, 2009 – 5/25 version

8:00 AM Registration and Exhibits Open

9:00 AM - 12:00 PM Opening Plenary Session

Opening Remarks by Erol Tutumluer and Imad Al-Qadi

Keynote Presentation on Roads: “Recent and landmark improvements in performance characterization of unbound aggregate bases and subbases and sublayers comprised of Chemically Stabilized Materials (CSMs)”
by Professor Dallas N. Little
Texas A&M University, Texas, USA

Keynote Presentation on Railways: “The performance of rail track incorporating the effects of ballast breakage, confining pressure and geosynthetic reinforcement”
by Professor Buddhima Indraratna
University of Wollongong, Australia

Keynote Presentation on Airfields: “Airport pavement design for the 21st century”
by Dr. Satish K. Agrawal
Federal Aviation Administration, William J. Hughes Technical Center, New Jersey, USA

12:00 PM-1:30 PM Lunch at Exhibit Hall
1:30 PM-3:15 PM Technical Track 1

Concurrent Session 1A: Subgrade Soils

Precision triaxial equipment for the evaluation of the elastic behavior of soils
N. Araújo & A. Gomes Correia

A comparative subgrade evaluation using CBR, vane shear, light weight deflectometer, and resilient modulus tests
N. Garg, A. Larkin & H. Brar

The effect of moisture hysteresis on resilient modulus of subgrade soils
C. Khoury & N. Khoury

Dynamic properties of a full weathering granite subgrade and other pavement materials studied by model tests
J. Zou, Z. Li & X. Cao

Concurrent Session 1B: Granular Materials

Pavement base unbound granular materials gradation optimization
J.P. Bilodeau, G. Doré & P. Pierre

Effect of grading and moisture on the deformation properties of unbound granular aggregates
L.U. Mathisen

IDOT test loop: evaluating the field performance of various dense graded aggregates
G. Heckel

Characterizing aggregate permanent deformation behavior based on types and amounts of fines
D. Mishra, E. Tutumluer, J. Kern & A. Butt
Concurrent Session 1C: Asphalt Mixtures

Contribution of asphalt mix components to permanent deformation resistance
P.M. Muraya, A.A.A. Molenaar & M.F.C. van de Ven

Fatigue resistance of hot mix asphalt at low temperatures
- Is there a way to reduce the test efforts?
K. Mollenhauer & M. Wistuba

Discrete element analysis of aggregate variability, blending, and fracture in asphalt mixture
E. Masad, E. Mahmoud & S. Nazarian

Long-term study on asphalt mixture segregation in Connecticut: preliminary results on use of MTV
D.J. Nener-Plante & A. Zofka

Concurrent Session 1D: Railroad Track Structures I

Pressure measurements and structural performance of hot mixed asphalt railway trackbeds
L.S. Bryson & J.G. Rose

Effects of incorporating a bituminous subballast layer on the deformation of railway trackbeds
T. Ferreira, P.F. Teixeira & R. Cardoso

An innovative slab track test-line in China
J. Ren, R. Xiang & B. Lechner

Comparison of in situ performance-based tests methods to evaluate moduli of railway embankments
A. Gomes Correia, J. Martins, L. Caldeira, E. Maranha das Neves & J. Delgado

3:15 PM-3:45 PM Break at Exhibit Hall
3:45 PM-5:30 PM Technical Track 2

Concurrent Session 2A: Subgrade Stabilization

Improving subgrade strength and pavement performance by chemical treating subgrade soils
*N. Bandara & M.J. Grazioli*

A performance study of different curing materials applied to soil-Portland cement base course cure
*R.M. Fortes & J.V. Merighi*

Sustainable reconstruction of highways with in-situ reclamation of materials stabilized for heavier loads
*H. Wen & T.B. Edil*

The use of geofiber and synthetic fluid for stabilizing marginal soils
*K. Hazirbaba & B. Connor*

Concurrent Session 2B: Resilient Behavior of Granular Materials

Resilient modulus of hydraulically bound road base materials with high volume waste dust
*H. Al Nageim & P. Visulios*

Characterizing natural and recycled granular materials for (sub)base layers of roads by cyclic triaxial testing
*C. Grégoire, B. Dethy, J. Detry & A. Gomes Correia*

Resilient modulus of unbound base material containing extra waste Stancombe limestone dust
*B. Saghafi & H. Al Nageim*

Resilient characteristics of bottom ash
*H.H. Titi, A.R. Coenen & M.B. Elias*
Concurrent Session 2C: Asphalt Mixture Evaluation

Use of polymer modified binders to reduce rutting in Nordic asphalt pavements
B.O. Lerfald, J. Aurstad & N.S. Uthus

Development of wear resistant pavements using polymer modified binders
R.G. Saba, L.J. Bakløkk, J. Aksnes & B.O. Lerfald

Laboratory evaluation of warm mix asphalt using Sasobit®
S.W. Goh, Y. Liu & Z. You

Laboratory characterization of half-warm mix asphalts with high recycling rate by means of the factorial experiment design approach
F. Olard, E. Beduneau, D. Bonneau, S. Dupriet & N. Seignez

Concurrent Session 2D: Railroad Track Structures II

Evaluation of roadbed stiffness on bearing capacity of railroad ballast with discontinuous analysis
T. Ishikawa, T. Kamei, E. Sekine & Y. Ohnishi

Actions on railway track panel and ballast - behavior of the Hellenic limestone ballast
K. Giannakos & A. Loizos

Ballast evaluation and hot mix asphalt performance
H.M. Lees

Comparison of coal dust fouled railroad ballast behavior – granite vs. limestone
W. Dombrow, H. Huang & E. Tutumluer

6:30 PM-8:30 PM Technical Visit - Advanced Transportation Research and Engineering Laboratory (ATREL) - Barbeque Reception
Day 2 - Wednesday, July 1, 2009

7:30 AM Registration

8:00 AM-9:45 AM Technical Track 3

Concurrent Session 3A: Subgrade Bearing Capacity Designs

Subgrade modification - practitioner’s experience
T. McCleary

“Baku Bayil Yard Site” soil improvement geotechnical works
E. Guler, A. Gure & E. Cetin

Design methodology based on strength and its application to full weathering granite used in highway subgrade
Z. Li & C. Dong

Taxiway embankment over soft ground using staged construction
R. Wells, X. Barrett & T. Wells

Concurrent Session 3B: Permanent Deformation Behavior of Granular Materials

Analytical evaluation of unbound granular layers in regard to permanent deformation
L.A.T. Brito, A.R. Dawson & P.J. Kolisoja

Influence of the macroscopic cohesion on the 3D FE modeling of a flexible pavement rut depth
F. Allou, C. Petit, C. Chazallon, & P. Hornych

Use of 3-dimensional discrete element model to examine aggregate layer particle movement due to load wander
P.R. Donovan, E. Tutumluer & H. Huang

Processed Portuguese steel slag – a new geomaterial
A. Gomes Correia, S.M. Reis Ferreira, A.J. Roque & A. Cavalheiro
Concurrent Session 3C: Modulus and Deformation Behavior of Asphalt Mixtures

Evaluation of different predictive dynamic modulus models of asphalt mixtures used in Argentina
_F.O. Martínez & S.M. Angelone_

Prediction of the dynamic modulus of Superpave mixes
_A.Abu Abdo, F. Bayomy, R. Nielsen, T. Weaver, S.J. Jung & M.J. Santi_

Dynamic modulus prediction of asphalt concrete using three tensile tests
_S. Adhikari & Z.You_

Assessing low temperature properties of asphalt materials by means of static testing techniques
_M. Wistuba, K. Mollenhauer & K. Metzker_

Concurrent Session 3D: Railroad Track Structures III

Measurement of vibrations induced by high-speed trains

Influence of the stiffness-damping coupling of the foundation in the performance of a high-speed train track
_J. Cunha & A. Gomes Correia_

Emerging trends for high-speed rail track superstructures – ballastless track as an alternative to the ballasted track
_A.M. Paixão, E.C. Fortunato & M.L. Antunes_

Dynamic responses and cyclic settlement of railway substructure
_X. Bian_

9:45 AM - 10:15 AM Break at Exhibit Hall
10:15 AM-12:00 PM Technical Track 4

**Concurrent Session 4A: Subgrade Continuous Compaction Control**

Alternatives to heavy test rolling for cohesive subgrade assessment  
*D.J. White, P.K.R. Vennapusa, H.H. Gieselman, L. Johanson & J. Siekmeier*

Appraisal of density-based field compaction control test validity  
*J. Sadrekarimi & S. Seyyedi*

Continuous compaction control: Preliminary data from a Delaware case study  
*F.S. Tehrani & C.L. Meehan*

Geostatistical analysis of roller-integrated continuous compaction control data  
*N. Facas, M. Mooney & R. Furrer*

**Concurrent Session 4B: Recycled Concrete as Unbound Materials**

Unbound crushed concrete in high volume roads – evaluation of field behavior and structural performance  
*J. Aurstad, J.E. Dahlhaug & G. Berntsen*

Structural evaluation of rubblized concrete pavements in Iowa  
*H. Ceylan, K. Gopalakrishnan & S. Kim*

Study on fully and highly efficiently recycling of waste concrete  
*L. Lu, Y. He & S. Hu*

Idaho Airport saves time and money with full-depth reclamation  
*G.E. Halsted*
Concurrent Session 4C: Performance Evaluations of Asphalt Mixtures

Research and applications of new pavement structure based on large stone porous asphalt mixture
B. Yufeng, W. Songgen & G. Huber

Ageing of stone mastic asphalt and evaluation of cracking resistance
S. Büchler, K. Mollenhauer, M. Wistuba & P. Renken

Permanent deformation evaluation of Idaho Superpave mixes using the gyratory stability
F. Bayomy, A.A. Abdo & M.J. Santi

Multidirectional behavior of bituminous mixture
P. Clec’h, C. Sauzéat & H. Di Benedetto

Concurrent Session 4D: Railroad Track Structures IV

Railway bridge transition case study
J.P. Hyslip, D. Li & C.R. McDaniel

Reducing track faults using polymer geocomposite technology
P.K. Woodward, G. Medero & D.V. Griffiths

Discrete Element Model of Ballast Aggregates Based on Imaging
H. Huang, E. Tutumluer, Y.M.A. Hashash, J. Ghaboussi

12:00 PM - 1:30 PM Lunch at Exhibit Hall
1:30 PM - 3:15 PM Technical Track 5

Concurrent Session 5A: Compaction and Construction of Geomaterials

Long-term in-situ measurements of concrete culverts with high fills
J. Vaslestad, G.Y. Yesuf & T.H. Johansen

Application of gray theory in settlement forecast of rock-fill highway embankment
X. Wang, W. Qin, M.C. Wang & Z. Wang

Data mining applied to compaction of geomaterials
R. Marques, A. Gomes Correia & P. Cortez

Study of dry sludge stabilization from water treatment plant (WTP) in Taiaçupeba to use as compacted soil in earthwork ditches

Concurrent Session 5B: Climatic Conditions Affecting Pavements

Seasonal coefficients for the pavement roads in Polish climate conditions
M. Graczyk

Effect of a changed climate on gravel roads
P.O. Aursand & I. Horvli

Water impact on the structural behavior of a pavement structure
S. Erlingsson

Mitigating unbound roadway rutting caused by groundwater movement
V. Diyaljee
Concurrent Session 5C: Construction and Performances of Asphalt Mixtures

Construction and field performance of hot mix asphalt with moderate and high RAP contents
R. West, N. Tran, A. Kvasnak, B. Powell & P. Turner

Viability of the use of construction and demolition debris in hot mix asphalt
I. Pérez, M. Toledano & J. Gallego

Design of pavements containing foamed bitumen recycled layers
M. Losa, R. Bacci, A. Terrosi Axerio & P. Leandri

Use of bitumen emulsion in urban paving
C.R. de Carvalho Filho, F.P. Cavalcante, C. de Medeiros Brito Cavalcante, J.A. Gonçalves de Macêdo & I.D da Silva Pontes Filho

Concurrent Session 5D: Bearing Capacity Designs of Airfield Pavements

Full-scale aircraft tire pressure tests
C. Fabre, J. Balay, P. Lerat & A. Mazars

A robust approach for the evaluation of airport pavement bearing capacity
Y.H. Lee, Y.B. Liu, J.D. Lin & H.W. Ker

Estimating bearing capacity for opportune landing sites
R. Affleck, L. Barna, S. Shoop & C. Ryerson

Evaluation of runway bearing capacity: in-situ measurements and laboratory tests
A. Graziani, F. Cardone, E. Santagata & S. Barbati

3:15 PM - 3:45 PM Break at Exhibit Hall
3:45 PM - 5:30 PM Technical Track 6

Concurrent Session 6A: In-Situ Measurement Techniques and Developments

Development of the UK highways agency traffic speed deflectometer
*B. Ferne, P. Langdale, N. Round & R. Fairclough*

Three years of high speed deflectograph measurements of the Danish state road network
*S. Baltzer*

Deflection measurement: the need of a continuous and full view approach
*J.-M. Simonin, L.-M. Cottineau, V. Muzet, C. Heinkele & Y. Guillard*

3D visualization model of road surface
*X. Li, S. Ma & X. Hou*

Concurrent Session 6B: Temperature Changes Affecting Pavements

Thermal stresses of asphalt pavement with temperature-dependent modulus of elasticity
*Y. Zhong & L. Geng*

Use of Ground Penetrating Radar for detection of salt concentration on Norwegian winter roads
*A. Lalagüe, I. Hoff, E. Eide & A. Svanekil*

Seal courses for a soft asphalt pavement with semi-rigid base in cold regions
*X. Wang, X. Zhang & Y. Tan*

Thermal stress analysis in ultra-thin whitetopping pavement
*J.R. Roesler & D. Wang*
Concurrent Session 6C: Applications of Recycled Materials - Asphalt

Bearing capacity assessment of recycled asphalt pavements
*V. Papavasiliou & A. Loizos*

The influence of virgin aggregate content on the strength and modulus of cold in place reclaimed asphalt pavement
*H. Wang, P. Hao & K. Zhang*

Hot mix asphalt produced from marble waste
*C. Gurer, H. Akbulut & A. Yildiz*

Expansive characteristics of RAP materials for use as aggregates in the pavement substructure layers
*D. Deniz, E. Tutumluer & J.S. Popovic*

Concurrent Session 6D: Construction and Testing of Concrete Pavements

Fiber-reinforced concrete pavement design and material requirements
*A. Bordelon & J. Roesler*

Analysis of in-pavement sensor data for CC2 new rigid test items at the FAA National Airport Pavement Test Facility
*D.R. Brill & E.H. Guo*

Comparison of precast and cast-in-place concrete pavements responses under heavy vehicle simulator loads
*E. Kohler, J. Harvey, L. du Plessis & L. Motumah*

Field testing of concrete pavements at Chicago O’Hare International Airport
*Y.-S. Liu & D. Lange*

6:00 PM-8:00 PM  Conference Banquet  
I-Hotel and Conference Center
Day 3 - Thursday, July 2, 2009

7:30 AM Registration

8:00 AM-9:45 AM Technical Track 7

Concurrent Session 7A: Roadway Assessment Techniques I

Structural roadway assessment with frequency response function
J.-M. Simonin & D. Lièvre & J.-C. Dargenton

A method for benefiting pavement quality assurance measures related to roughness condition surveys
C. Plati & A. Loizos

Development and testing of low noise pavements in Norway
J. Aksnes, R.G. Saba & T. Berge

Roughness progression models by regression and artificial neural network techniques
E. Taddesse & H. Mork

Concurrent Session 7B: Nondestructive Structural Evaluation I

The use of impact-stiffness modulus outputs from FWD measurements to determine PCN in Israel
M. Livneh

Temperature correction of falling weight deflectometer measurements
E. Straube & D. Jansen

Lightweight deflectometers for quality assurance in road construction
P.R Fleming, M.W. Frost & J.P. Lambert

Going beyond elastic response while evaluating falling weight deflectometer data
C.A. Lenngren
Concurrent Session 7C: Reinforcement of Structural Layers

Performance of flexible pavements reinforced with steel fabric
*S.F. Said, H. Carlsson & H. Hakim*

Evaluation of geogrid displacement on subbase reinforcement using specially designed pullout test
*M.V. Akpinar & T. Sert*

In-situ strain measurement during dynamic shear loading of an unbound geogrid reinforced pavement section
*B.R. Cox, B. Curry, C.M. Wood, C. Young & J.S. McCartney*

Experimental study on bearing capacity of geocell-reinforced bases
*S.K. Pokharel, J. Han, R.L. Parsons, Y. Qian, D. Leshchinsky & I. Halahmi*

Concurrent Session 7D: Modeling of Materials and Pavement Systems I

PFC2D simulation research on vibrating compaction test of soil and rock aggregate mixture
*X. Jia, H. Chai, Z. Yan & Y. Zheng*

Finite element analyses of pavement materials at or near failure: a constant bulk modulus approach
*C. Gonzalez & S. Jersey*

Axi-symmetric analyses of vertically inhomogeneous elastic multilayered systems
*J.W. Maina, Y. Ozawa & K. Matsui*

Effects of bearing capacity and load transfer efficiency of jointed concrete pavements on reflective cracking in hot-mix asphalt overlays
*J. Baek & I.L. Al-Qadi*

9:45 AM - 10:15 AM Break at Exhibit Hall
10:15 AM-12:00 PM Technical Track 8

Concurrent Session 8A: Roadway Assessment Techniques II

Structural assessment of the English strategic road network – latest developments
B. Ferne, R. Sinhal & R. Fairclough

Nature resources and functional road design criteria
C.A. Lenngren & R. Fredriksson

Dynamic response of rigid pavements under moving traffic loads with variable velocities
Y. Zhong & L. Geng

Pavement contribution to truck rolling resistance
C.A. Lenngren

Concurrent Session 8B: Nondestructive Structural Evaluation II

Practical use of light weight deflectometer for pavement design
S. Baltzer, C. Hejlesen, H.C. Korsgaard & P.E. Jakobsen

Analysis of FWD data and characterization of airfield pavement materials in New Mexico
M.U. Ahmed, R. Bisht & R.A. Tarefder

Evaluation of asphalt road pavement rehabilitation using steel mesh reinforcement
J.M.C. Neves & A.R.D. Alves

The use of surfacing service life as a parameter in pavement strengthening design
G. Refsdal, R. Johansen & G. Berntsen
Concurrent Session 8C: Mechanistic-Empirical Design Applications

Comparison of design thickness between the 1993 AASHTO Guide and MEPDG for full depth reclamation pavement
Y. Ji & T.E. Nantung

Influence of unbound materials on flexible pavement performance: a comparison of the AASHTO and MEPDG methods
C.W. Schwartz

Verification of mechanistic-empirical pavement design guide for the state of New Jersey
N. Siraj, Y.A. Mehta, K.M. Muriel & R.W. Sauber

Mechanistic evaluation of second generation preservation overlays
D.A. Morian, S. Sadasivam, S.M. Stoffels, G. Chehab & T. Kumar

Concurrent Session 8D: Modeling of Materials and Pavement Systems II

Rigid pavement reinforcement: modeling of structural behavior
P. Domingos, M. Antunes & J. Neves

Joint modeling for JPCP: successes and pending problems
E. Guo

FEM analysis of the bearing plate deflection tests on rubblized concrete pavement
Y. Liu, Y. Sheng, & L. Wang

Design of pavement rehabilitation to reduce the reflective cracking in pavements with cement stabilized bases
E. Padilla

12:00 PM - 1:30 PM Lunch at Exhibit Hall
1:30 PM - 3:15 PM Technical Track 9

Concurrent Session 9A: Backcalculation Analyses of Deflection Measurements

Backcalculation of the stiffnesses of cement treated base courses using artificial intelligence
M. Miradi & A.A.A. Molenaar, M.F.C. van de Ven & S. Molenaar

CalBack: New backcalculation software for Caltrans mechanistic-empirical design
Q. Lu, J.M. Signore, P. Ullidtz, I. Basheer & K. Ghuzlan

SOFTSYS for backcalculation of full-depth asphalt pavement layer moduli
O. Pekcan, E. Tutumluer & J. Ghaboussi

Deterministic-empirical backcalculation of LWD deflection basins
R.N. Stubstad, H.C. Korsgaard, K. Olsen, & J.P. Pedersen

Concurrent Session 9B: Nondestructive Structural Evaluation III

Models to estimate k subgrade reaction modulus values based on deflection basin parameters

Using falling weight deflectometer data for new construction interactive design
C.A. Lenngren

Automated pavement thickness evaluation for FWD backcalculation
K.R. Maser, L.A. McGrath, B.C. Miller, H. Ceylan & G. Sanati

Lessons learned during regular monitoring of in situ pavement bearing capacity conditions
P. Paige-Green
Concurrent Session 9C: Modeling Interlayers and Overlay Systems

Evaluation of effectiveness of FWD use for assessment of pavement interlayer bond
*D. Sybilski, T. Mechowski & P. Harasim*

A case study: quantification and modeling of asphalt overlay delamination on an airport pavement
*E. Horak, J.W. Maina & S.E. Emery*

Mechanistic modeling of potential interlayer slip at base sub-base level
*E. Horak, J.W. Maina, S.E. Emery & B. Walker*

Unbonded concrete overlay movements in response to gear loads
*D. A. Morian, S. Sadasivam, J. Reiter, S. M. Stoffels, L. Yeh & A. Ioannides*

3:15 PM - 3:45 PM Break at Exhibit Hall
3:45 PM -5:30 PM Technical Track 10

Concurrent Session 10A: Bearing Capacity Designs for Challenging Conditions & Load Effects

68_Load bearing analysis of EPS-block geofoam embankments
D. Arellano & T.D. Stark

252_Shear strength properties of naturally occurring bituminous sands
J. Anochie-Boateng & E. Tutumluer

46_The discussion on the “b” value of the axle load conversion in China
X. Wang & L. Zhang

103_A review of the influence of chalk on pavement performance in the South East of England, UK
M. Zohrabi

Concurrent Session 10B: Full-Scale and Structural Testing for Bearing Capacity

16_Validation of NCAT structural test track experiment using INDOT APT facility
E. Levenberg

54_Using the viscoelasticity and continuum damage theories to quantify the effects of loading speed in accelerated pavement testing results

20_The premature failure of slab pavements on heavily trafficked industrial sites
C. Van Geem & O. De Myttenaere

Soil Characterization for Orion Contingency Land Landings
E. Heymsfield

5:30 PM -6:00 PM CLOSING SESSION
Friday, July 3, 2009

8:00 AM-5:00 PM

Technical Visit - Chicago O'Hare International Airport Modernization Program