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

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: “From bearing capacity to mechanistic design: the role of soil mechanics in asphalt pavement engineering”
by Professor Stephen F. Brown
Nottingham Transportation Engineering Center, United Kingdom

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 and Exhibits
1:30 PM-3:15 PM Technical Track 1

Concurrent Session 1A: Subgrade Soils

244_Precision triaxial equipment for the evaluation of the elastic behavior of soils
_N. Araújo & A. Gomes Correia_

123_A comparative subgrade evaluation using CBR, vane shear, light weight deflectometer, and resilient modulus tests
_N. Garg, A. Larkin & H. Brar_

158_The effect of moisture hysteresis on resilient modulus of subgrade soils
_C. Khoury & N. Khoury_

159_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

111_Pavement base unbound granular materials gradation optimization
_J.P. Bilodeau, G. Doré & P. Pierre_

188_Effect of grading and moisture on the deformation properties of unbound granular aggregates
_L.U. Mathisen_

194_IDOT test loop: evaluating the field performance of various dense graded aggregates
_G. Heckel_

262_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

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

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

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

242  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

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

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

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

248  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 and Exhibits
3:45 PM-5:30 PM Technical Track 2

Concurrent Session 2A: Subgrade Stabilization

87_Improving subgrade strength and pavement performance by chemical treating subgrade soils
*N.Bandara & M.J. Grazioli*

98_A performance study of different curing materials applied to soil-Portland cement base course cure
*R.M. Fortes & J.V. Merighi*

183_Sustainable reconstruction of highways with in-situ reclamation of materials stabilized for heavier loads
*H. Wen & T.B. Edil*

184_The use of geofiber and synthetic fluid for stabilizing marginal soils
*K. Hazirbaba & B. Connor*

Concurrent Session 2B: Resilient Behavior of Granular Materials

231_Resilient modulus of hydraulically bound road base materials with high volume waste dust
*H. Al Nageim & P. Visulios*

232_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*

233_Resilient modulus of unbound base material containing extra waste Stancombe limestone dust
*B. Saghafi & H. Al Nageim*

243_Resilient characteristics of bottom ash
*H.H. Titi, A.R. Coenen & M.B. Elias*
Concurrent Session 2C: Asphalt Mixture Evaluation

63_Use of polymer modified binders to reduce rutting in Nordic asphalt pavements  
B.O. Lerfald, J. Aurstad & N.S. Uthus

129_Development of wear resistant pavements using polymer modified binders  
R.G. Saba, L.J. Bakløkk, J. Aksnes & B.O. Lerfald

168_Laboratory evaluation of warm mix asphalt using Sasobit®  
S.W. Goh, Y. Liu & Z. You

7_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

22_Evaluation of roadbed stiffness on bearing capacity of railroad ballast with discontinuous analysis  
T. Ishikawa, T. Kamei, E. Sekine & Y. Ohnishi

124_Actions on railway track panel and ballast - behavior of the Hellenic limestone ballast  
K. Giannakos & A. Loizos

162_Ballast evaluation and hot mix asphalt performance  
H.M. Lees

264_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

195_ Subgrade modification - practitioner’s experience
   T. McCleary

205_ “Baku Bayil Yard Site” soil improvement geotechnical works
   E. Guler, A. Gure & E. Cetin

160_ Design methodology based on strength and its application to full
     weathering granite used in highway subgrade
   Z. Li & C. Dong

146_ Taxiway embankment over soft ground using staged construction
    R. Wells, X. Barrett & T. Wells

Concurrent Session 3B: Permanent Deformation Behavior of Granular Materials

206_ Analytical evaluation of unbound granular layers in regard to
     permanent deformation
   L.A.T. Brito, A.R. Dawson & P.J. Kolisoja

121_ Influence of the macroscopic cohesion on the 3D FE modeling of a
     flexible pavement rut depth
   F. Allou, C. Petit, C. Chazallon, & P. Hornych

266_ Use of 3-dimensional discrete element model to examine
     aggregate layer particle movement due to load wander
   P.R. Donovan, E. Tutumluer & H. Huang

214_ 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

102_Evaluation of different predictive dynamic modulus models of asphalt mixtures used in Argentina
_F.O. Martínez & S.M. Angelone_

165_Prediction of the dynamic modulus of Superpave mixes
_A.Abu Abdo, F. Bayomy, R. Nielsen, T. Weaver, S.J. Jung & M.J. Santi_

169_Dynamic modulus prediction of asphalt concrete using three tensile tests
_S. Adhikari & Z.You_

171_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

212_Measurement of vibrations induced by high-speed trains

211_Influence of the stiffness-damping coupling of the foundation in the performance of a high-speed train track
_J. Cunha & A. Gomes Correia_

44_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 and Exhibits
Concurrent Session 4A: Continuous Compaction Control

118 Alternatives to heavy test rolling for cohesive subgrade assessment

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

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

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

Concurrent Session 4B: Applications of Recycled Materials - Concrete

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

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

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

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

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

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

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

239. Multidirectional behavior of bituminous mixture
   P. Clec'h, C. Sauzèat & H. Di Benedetto

Concurrent Session 4D: Railroad Track Structures IV

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

161. 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 and Exhibits
1:30 PM - 3:15 PM Technical Track 5

Concurrent Session 5A: Compaction and Construction of Geomaterials

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

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

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

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

Concurrent Session 5B: Bearing Capacity Designs for Climatic Conditions I

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

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

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

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

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

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

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

97. 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

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

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

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

157. 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 and Exhibits
3:45 PM - 5:30 PM Technical Track 6

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

72_Development of the UK highways agency traffic speed deflectometer
_B. Ferne, P. Langdale, N. Round & R. Fairclough_

151_Three years of high speed deflectograph measurements of the
Danish state road network
_S. Baltzer_

217_Deflection measurement: the need of a continuous and full
view approach

148_3D visualization model of road surface
_X. Li, S. Ma & X. Hou_

Concurrent Session 6B: Bearing Capacity Designs for Climatic Conditions II

18_Thermal stresses of asphalt pavement with temperature-dependent
modulus of elasticity
_Y. Zhong & L. Geng_

26_Use of Ground Penetrating Radar for detection of salt concentration
on Norwegian winter roads
_A. Lalaguë, I. Hoff, E. Eide & A. Svanekil_

40_Seam courses for a soft asphalt pavement with semi-rigid base in cold regions
_X. Wang, X. Zhang & Y. Tan_

58_Thermal stress analysis in ultra-thin whitetopping pavement
_J.R. Roesler & D. Wang_
Concurrent Session 6C: Applications of Recycled Materials - Asphalt

82_Bearing capacity assessment of recycled asphalt pavements  
V. Papavasiliou & A. Loizos

94_The influence of virgin aggregate content on the strength and modulus of cold in place reclaimed asphalt pavement  
H. Wang, P. Hao & K. Zhang

202_Hot mix asphalt produced from marble waste  
C. Gurer, H. Akbulut & A. Yildiz

265_Expansive characteristics of RAP materials for use as aggregates in the pavement substructure layers  
D. Deniz, E. Tutumluer & J.S. Popovics

Concurrent Session 6D: Construction and Testing of Concrete Pavements

53_Fiber-reinforced concrete pavement design and material requirements  
A. Bordelon & J. Roesler

39_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

88_Comparison of precast and cast-in-place concrete pavements responses under heavy vehicle simulator loads  
E. Kohler, J. Harvey, L. du Plessis & L. Motumah

89_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

216_Structural roadway assessment with frequency response function
J.-M. Simonin & D. Lièvre & J.-C. Dargent

167_A method for benefiting pavement quality assurance measures
related to roughness condition surveys
C. Plati & A. Loizos

64_Development and testing of low noise pavements in Norway
J. Aksnes, R.G. Saba & T. Berge

66_Roughness progression models by regression and artificial neural
network techniques
E. Taddesse & H. Mork

Concurrent Session 7B: Nondestructive Structural Evaluation I

9_The use of impact-stiffness modulus outputs from FWD measurements to
 determine PCN in Israel
M. Livneh

12_Temperature correction of falling weight deflectometer measurements
E. Straube & D. Jansen

29_Lightweight deflectometers for quality assurance in road construction
P.R Fleming, M.W. Frost & J.P. Lambert

61_Going beyond elastic response while evaluating falling weight
deflectometer data
C.A. Lenngren
Concurrent Session 7C: Reinforcement of Structural Layers

38_ Performance of flexible pavements reinforced with steel fabric
S.F. Said, H. Carlsson & H. Hakim

33_ Evaluation of geogrid displacement on subbase reinforcement using specially designed pullout test
M.V. Akpinar & T. Sert

107_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

176_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 and Methods of Functional Testing I

135_PFC2D simulation research on vibrating compaction test of soil and rock aggregate mixture
X. Jia, H. Chai, Z. Yan & Y. Zheng

137_Axi-symmetric analyses of vertically inhomogeneous elastic multilayered systems
J.W. Maina, Y. Ozawa & K. Matsui

200_FEM analysis of the bearing plate deflection tests on rubblized concrete pavement
Y. Liu, Y. Sheng, & L. Wang

253_Finite element analyses of pavement materials at or near failure: a constant bulk modulus approach
C. Gonzalez & S. Jersey

9:45 AM - 10:15 AM Break and Exhibits
10:15 AM-12:00 PM Technical Track 8

Concurrent Session 8A: Roadway Assessment Techniques II

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

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

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

69. Pavement contribution to truck rolling resistance
   C.A. Lenngren

Concurrent Session 8B: Nondestructive Structural Evaluation II

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

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

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

50. 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

11_Comparison of design thickness between the 1993 AASHTO Guide and MEPDG for full depth reclamation pavement
Y. Ji & T.E. Nantung

246_Influence of unbound materials on flexible pavement performance: a comparison of the AASHTO and MEPDG methods
C.W. Schwartz

75_Verification of mechanistic-empirical pavement design guide for the state of New Jersey
N. Siraj, Y.A. Mehta, K.M. Muriel & R.W. Sauber

142_Mechanistic evaluation of second generation preservation overlays
D.A. Morian, S. Sadasivam, S.M. Stoffels, G. Chehab & T. Kumar

Concurrent Session 8D: Modeling and Methods of Functional Testing II

30_Rigid pavement reinforcement: modeling of structural behavior
P. Domingos, M. Antunes & J. Neves

78_Joint modeling for JPCP: successes and pending problems
E. Guo

263_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

57_Design of pavement rehabilitation to reduce the reflective cracking in pavements with cement stabilized bases
E. Padilla

12:00 PM - 1:30 PM Lunch and Exhibits
Concurrent Session 9A: Backcalculation Analyses of Deflection Measurements

35_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

255_SOFTSYS for backcalculation of full-depth asphalt pavement layer moduli
O. Pekcan, E. Tutumluer & J. Ghaboussi

261_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

154_Models to estimate k subgrade reaction modulus values based on deflection basin parameters

65_Using falling weight deflectometer data for new construction interactive design
C.A. Lenngren

245_Automated pavement thickness evaluation for FWD backcalculation
K.R. Maser, L.A. McGrath, B.C. Miller, H. Ceylan & G. Sanati

235_Lessons learned during regular monitoring of in situ pavement bearing capacity conditions
P. Paige-Green
Concurrent Session 9C: Modeling Interlayers and Overlay Systems

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

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

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

141. 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 and Exhibits
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  
   *K.M. Theisen, D.R. Victorino, W.P. Nunez & J.A.P. Ceratti*

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 - 5:45 PM Break

5:45 PM - 6:30 PM CLOSING SESSION
Friday, July 3, 2009

8:00 AM-5:00 PM

Technical Visit - Chicago O'Hare International Airport Modernization Program