Conference Program

2nd International Conference on Transportation Geotechnics

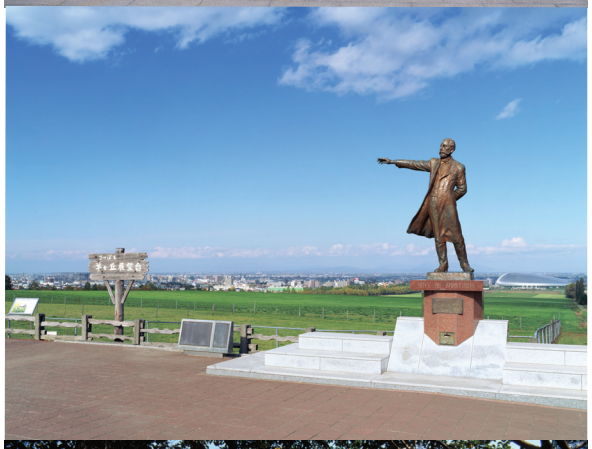
IS-Hokkaido 2012

September 10 - 12, 2012

Sapporo, Hokkaido
JAPAN

Conference at a glance

	Sep.9	Sep.10	Sep.11	Sep.12
9:30			**Keynote Lecture** "Performance Evaluation of Shock Mats and Synthetic Grids in the Improvement of Rail Ballast" Professor B. Indraratna	**Keynote Lecture** "Bituminous Mixtures: from Thermo-mechanical Properties of Components to Structure Calculation" Professor H. Di Benedetto
10:00		**Opening Ceremony**		
10:15			**Break**	**Break**
10:45			**Tech. Session** TS-4A Risk Assesment and Environmental Issues (1) TS-4B Geotechnics for Pavement, Rail Track and Airfield (4) TS-4C Modeling and Numerical Simulations (1)	**Tech. Session** TS-6A Laboratory Testing and In-situ Testing (4) TS-6B Geomaterial, including Nontraditional Materials (1) TS-6C Modeling and Numerical Simulations (3)
11:00		**Special Lecture** "Trends and Challenges in Earthworks for Transportation Infrastructures" Professor A. Gomes Correia Professor J.-P. Magnan		
12:00				
12:15		**Lunch**	**Lunch**	**Lunch**
13:30	**Workshop 1** Intelligent Compaction (IC) **Workshop 2** Challenges for Transportation Geotechnics in Extreme Climates	**Tech. Session** TS-1A Laboratory Testing and In-situ Testing (1) TS-1B Geotechnics for Pavement, Rail Track and Airfield (1) TS-1C Earthworks for Transportation Facilities TS-1D Asphalt Mixtures and Hydraulically-bound Materials	**Keynote Lecture** "GRS Structures Recently Developed and Constructed for Railways and Roads in Japan" Professor F. Tatsuoka	**Keynote Lecture** "Soil Suction Measurements in Highway Subgrades" Professor D. G. Fredlund
14:15			**Keynote Lecture** "Sustainable Pavement Construction Utilizing Engineered Unbound Aggregate Layers" Professor E. Tutumluer	**Break**
14:45				
15:00		**Break**	**Break**	**Tech. Session** TS-7A Performance Evaluation and Quality Control TS-7B Geomaterial, including Nontraditional Materials (2) TS-7C Sustainability of Management and Rehabilitation
15:30	**Break**	**Tech. Session** TS-2A Laboratory Testing and In-situ Testing (2) TS-2B Geotechnics for Pavement, Rail Track and Airfield (2) TS-2C Design, Construction and Maintenance (1) TS-2D Application of Geosynthetics	**Tech. Session** TS-5A Risk Assesment and Environmental Issues (2) TS-5B Geotechnics for Pavement, Rail Track and Airfield (5) TS-5C Modeling and Numerical Simulations (2)	
16:00				
16:15				**Break**
16:30	**Workshop 1** Intelligent Compaction (IC) **Workshop 3** Geotechnical Challenges in Rail Track and its Transition Zones			**Closing Ceremony**
17:00			**Break**	
17:20		**Break**	**Special Lecture** "Mechanical Behavior and Earthquake-induced Failures of Volcanic Soils in Japan" Professor S. Miura	
17:30				
17:45		**Tech. Session** TS-3A Laboratory Testing and In-situ Testing (3) TS-3B Geotechnics for Pavement, Rail Track and Airfield (3) TS-3C Design, Construction and Maintenance (2)		
18:00				
18:30				
19:00				
19:30		**Welcome Party**	**Banquet**	
20:30				
21:30				



札幌 Sapporo

Table of Contents

Welcome Messege

“Welcome to Sapporo!”
さっぽろへようこそ！

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), the Japanese Geotechnical Society (JGS), and the Hokkaido University welcome you to the Second International Conference on Transportation Geotechnics (2nd ICTG), Sapporo, Japan.

The 2nd ICTG is being organized, under the auspices of the ISSMGE, by the local organizing committee composed of the Hokkaido Branch and the TC202 national committee of the Japanese Geotechnical Society (JGS), in association with the International Technical Committee ISSMGE-TC202 “Transportation Geotechnics”, and in close liaison with ISSMGE-TC101 (Laboratory Stress-Strain Strength Testing of Geomaterials), ISSMGE-TC106 (Unsaturated Soils), and ISSMGE-TC216 (Frost Geotechnics) of the ISSMGE.

This conference aims at contributing to creating new academic frameworks called Transportation Geotechnics which work more on practical issues such as design, construction and maintenance management of transportation infrastructure like roads, railways, and airfields. Also, it targets to be a suitable platform for the exchanging and sharing of engineering ideas, state-of-the-art knowledge, and research results on Transportation Geotechnics among leading researchers and technical experts, through 7 keynote lectures by prominent academics in this field, 140 oral presentations, and 3 pre-conference workshops. We are delighted to announce that almost 250 delegates from 30 countries will attend this conference.

Along with the conference, please enjoy the autumn of Sapporo. Sapporo is Japan’s 5th largest city with a population of 1.9 million, and the capital of Japan’s northern island of Hokkaido. Despite being a large metropolis, the city reveals abundant natural scenery for each of the four seasons, even in the center of the city like here in Hokkaido University campus, and every year many tourists from both home and abroad visit the region, which is famous for being one of Japan’s leading producers of delicious foodstuff. Sapporo ranks number one among the places Japanese people would like to live.

We look forward to the excellent presentations, the constructive debates and wonderful opportunity to meet socially. It is my earnest hope that all the participants share a fruitful and successful conference and a comfortable and enjoyable stay in Sapporo, and that our short but significant meeting serves for participants as many as possible, especially both young researchers and students, to enhance their interests in Transportation Geotechnics and broaden their perspectives.

Welcome to Sapporo, Japan. Thank you very much for coming - we extend our warmest regards to you.

Seiichi MIURA
Chairperson of 2nd ICTG
Professor, Hokkaido University

Committees

Local Organizing Committee

Prof. Seiichi MIURA (Chair)
Dr. Nobuyuki YOSHIDA (Co-Chair)
Prof. Takashi ONO (Co-Chair)
Dr. Tatsuya ISHIKAWA (Secretary General)
Prof. Yukihiro KOHATA (Secretary)
Dr. Nagato ABE
Dr. Fumihiko FUKUDA
Mr. Hirofumi FUKUSHIMA
Dr. Yoshitaka HACHIYA
Dr. Kimitoshi HAYANO
Dr. Yoshio HISARI
Dr. Daiki HIRAKAWA
Mr. Shuji HIROCHO
Dr. Eizaburou HIROTSU
Mr. Shusaku HONDA
Mr. Yukihide ICHIKAWA
Dr. Tsutomu ISHIGAKI
Mr. Shinichi KAJITORI
Dr. Osamu KAMADA
Dr. Satsuki KATAOKA
Dr. Takayuki KAWAGUCHI
Prof. Shinichiro KAWABATA
Dr. Shima KAWAMURA
Mr. Chikara KAWAMURA
Mr. Kazuyuki KUBO
Mr. Kazuhiko MINETA
Dr. Yoshihisa MIYATA
Dr. Yoshitsugu MOMOYA
Mr. Shigehiro MORITA
Dr. Katsumi MURAMOTO
Dr. Tsutomu NAKAMURA
Dr. Satoshi NISHIMURA
Mr. Satoshi NISHIMOTO
Ms. Chiho OHKUBO
Prof. Kenichi SATO
Dr. Etsuo SEKINE
Prof. Yasushi TAKEUCHI
Prof. Kazuyoshi TATEYAMA
Mr. Norikazu TANAKA
Mr. Noboru YAKUWA
Prof. Satoshi YAMASHITA
Dr. Shoji YOKOHAMA

International Advisory Committee

Prof. Jean-Louis BRIAUD (USA)
Prof. Hervé Di BENEDETTO (France)
Mr. Andrew DAWSON (UK)
Prof. Guy DORÉ (Canada)
Prof. Delwyn G. FREDLUND (Canada)
Dr. Yoshitaka HACHIYA (Japan)
Prof. Kenji HIMENO (Japan)
Dr. Arne INSTANES (Norway)
Prof. Guan Lu JIANG (China)
Prof. Jean-Marie KONRAD (Canada)
Mr. Kazuyuki KUBO (Japan)
Dr. Suzanne LACASSE (Norway)
Prof. Kunihito MATSUI (Japan)
Mr. Junichi MIZUKAMI (Japan)
Prof. Taesoon PARK (South Korea)
Dr. Marc RAITHEL (Germany)
Dr. Seppo SAARELAINEN (Finland)
Dr. Shigeru SHIMENO (Japan)
Prof. Min-Ho SHIN (South Korea)
Prof. Kenichi SOGA (UK)
Prof. Makoto SUNAGA (Japan)
Prof. Lijun SUN (China)
Prof. Kazuyoshi TATEYAMA (Japan)
Dr. Masaru TATEYAMA (Japan)
Prof. Fumio TATSUOKA (Japan)
Prof. Hai-Sui YU (UK)

ISSMGE TC202 Executive Members

Prof. António Gomes CORREIA (Portugal, Chair)
Dr. Nobuyuki YOSHIDA (Japan, Secretary)
Prof. Carlo G. LAI (Italy)
Prof. Erol TUTUMLUER (USA)
Prof. Jean-Pierre MAGNAN (France)
Dr. Mike WINTER (UK)
Prof. Seong-Wan PARK (South Korea)
Prof. Soheil NAZARIAN (USA)
Prof. William POWRIE (UK)
Prof. Buddhima INDRARATNA (Australia)

Conference Information

Dates

Conference: Monday, September 10 through Wednesday, September 12, 2012

Workshops: Sunday, September 9, 2012

Venue

Conference: Conference Hall (Room A, B and C) and Centennial Hall (Room D)
Hokkaido University, Sapporo, Japan

Workshops: 4th Floor, L Plaza (Sapporo Center for Gender Equality), Sapporo, Japan

	Early bird On/Before July 31, 2012	Regular / On-site On/After August 1, 2012
ISSMGE Members **IGS Members**	45,000 JPY	55,000 JPY
JGS Members *	50,000 JPY	60,000 JPY
Others	60,000 JPY	70,000 JPY
Students	20,000 JPY	
Accompanying person(s)	10,000 JPY	
Banquet fee (Sep. 11)	6,000 JPY	

* In case your organization is a corporate member of JGS, you are allowed to make a registration as a JGS member.

Registration Fees (for Members, others and students) include:

- Access to ceremonies, lectures, sessions and workshops.
- The Program
- Proceedings (USB)
- A hardcopy of the abstract volume
- Lunches
- Refreshments

* Welcome party (Sep. 10) is free of charge for all of participants.

Accompanying person(s) Fee includes:

- Lunches
- Refreshments
- Accompanying persons program

* Welcome party (Sep. 10) is free of charge for all of participants.

Enjoy Japanese "Bento (Lunch box)" for Lunches!.

Lunches are provided for three days onsite. You will find Japanese, western styles and vegetarians' boxes. The lunch tickets are in your name tags. Please exchange it to a lunch box. Please note that the western style and vegetarians Boxes are limited.

Welcome Party

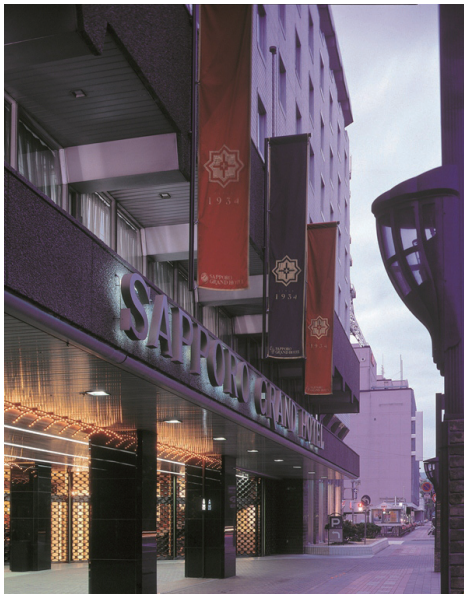
All of the participants are invited to the welcome party. The party will be held in Restaurant "ELM" of Faculty House Trillium in Hokkaido University.

Date Monday, September 10

Time 19:30 - 20:30

Fee Free of charge

Banquet



Why don't you join us for the conference banquet?
The banquet will be held in Sapporo Grand Hotel which was built in 1934 as the first European style hotel in Hokkaido and is one of the best hotel in the city. They serve very local dishes.

Date Tuesday, September 11

Time 19:30 - 21:30

Fee 6,000 JPY

Please show a banquet ticket to enter the room. The ticket is in your name tag.

Accompanying Persons Program: Flower arrangement in Japanese style

We invite accompanying persons to our special program: Kado, the way of the flowers.
This traditional art pursues quintessentially Japanese aesthetics, 'wabi-sabi' (simpleness and calmness) in a perfect harmony of vase, stems, leaves, branches and flowers.

Date Tuesday, September 11

Time 13:30 - 15:00

Venue Contennial Hall, Hokkaido University *See page 32

Fee Free of charge

11:00-12:00, Monday, September 10

Trends and Challenges in Earthworks for Transportation Infrastructures

Prof.
António Gomes CORREIA

C-TAC – Centre of Territory, Environment and Construction, University of Minho, Portugal

Graduated in Civil Engineering from the Technical University of Lisbon - IST in 1977, and received a Doctor-Engineer Degree by "Ecole Nationale des Ponts et Chaussées"- Paris in 1985.

In 1987 he gained the specialist degree at the National Laboratory of Civil Engineering (LNEC), distinguished with Manuel Rocha Award.

In 2001 he gets the degree of specialist in Geotechnique attributed by the Portuguese Association of Engineers.

In 1998, he created the Geotechnical Research Centre at the Technical University of Lisbon – IST and he was its President until 2000.

He is since 2003 Full Professor at the University of Minho and from 2003 to 2007 he was Director of the Civil Engineering Research Centre at the University of Minho, and from 2004 to 2008 President of the Geotechnical Portuguese Society. He is from 2010 Director of the Research Centre of Territory, Environment and Construction. He is also from 2010 chair of the Doctoral program in Civil Engineering.

He was Vice-Chairman of COST 337 – Unbound Granular Materials for Road Pavements, member of CEN TC227/WG4/TG2 on test methods for Unbound Granular Materials and was also a member of COST 348 - Reinforcement of Pavements with Steel Meshes and Geosynthetics.

He was from 1998 to 2001 Chairman of the ISSMGE - European Technical Committee - ETC 11 - Geotechnical aspects in design and construction of pavements and rail track and from 2001 chairman of the International Technical Committee - TC 3 – Geotechnics for pavements of the ISSMGE, renamed from 2009 as TC 202 – Transportation Geotechnics.

He is involved in research, teaching and consulting in the general field of geotechnics and pavement engineering for 34 years. His work embraced transportation geotechnics, particularly soil and pavement geo-material properties, compaction and geotechnical and pavement modelling and design. He has over 330 technical papers published on these subjects.

Prof.
Jean-Pierre MAGNAN

IFSTTAR, France

Graduated from "École Polytechnique" (Paris) in 1971 and from "École Nationale des Ponts et Chaussées" (Paris) in 1973 and received a Docteur-ès-Sciences Degree from University Pierre et Marie Curie (Paris) in 1984.

He is Head of the Geotechnical Engineering, Environment and Risks Department of the French Institute of Science and Technology for Transport, Development and Networks (IFSTTAR), former Laboratoire Central des Ponts et Chaussées (LCPC), and Professor of Soil and Rock Mechanics at the École Nationale des Ponts et Chaussées.

He is a member of CEN TC 250/SC7 (Eurocode 7), CEN TC 341 (Geotechnical Investigation and Testing), CEN TC 288 (Execution of Geotechnical Works) and CEN TC 396 (Earthworks) and chairman of the French Coordination Committee for Standardisation in Geotechnical Engineering.

He is involved in research, teaching and consulting in the general field of geotechnical engineering, in particular earth structures, natural risks, soil-structure interaction, soft or swelling soils, site investigations, modelling and design. He has over 300 technical papers published on these subjects.

17:00-18:00, Tuesday, September 11

Mechanical Behavior and Earthquake-induced Failures of Volcanic Soils in Japan

Prof. Seiichi MIURA
Laboratory of Analytical Geomechanics
Division of Field Engineering for the Environment
Hokkaido University, Japan

Dr. Seiichi Miura is professor in the Faculty of Engineering, Hokkaido University.

He was born in Hokkaido, Japan where he obtained bachelors and masters degrees from Hokkaido University. After earning his Ph.D. in geotechnical engineering in 1984, he taught and was on the faculty of engineering at the Muroran Institute of Technology as associate professor and professor before returning to Hokkaido University in 1998.

Professor Miura has been involved in research in many areas such as laboratory testing method for the practical development of granular mechanics, soil liquefaction, slope stability, mechanical behavior of problematic ground (volcanic soil), and many others in geotechnical and earthquake engineering areas. He is the author or co-author of more than 350 published technical papers in journals and proceedings in these fields.

Prof. Miura received the Japan Geotechnical Society (JGS) Award in 1985 and 2010 for the study on stress-strain-strength anisotropy of sands and the design method of pile foundation constructed in composite ground, respectively. He has been currently immersed in research on stability evaluation of slope and embankment subjected to rainfall and freeze-thaw actions based on field monitoring. Recent roles in academic societies were the leader for JGS committee for ground damages induced by the 2003 Tokachioki Earthquake and the social action work for the various damages due to the Tohoku Pacific Earthquake (2011) as the vice president of Japan Society of Civil Engineers (JSCE).

9:30-10:15, Tuesday, September 11

Performance Evaluation of Shock Mats and Synthetic Grids in the Improvement of Rail Ballast

Prof. Buddhima INDRARATNA

Professor of Civil Engineering and Research director
Centre for Geomechanics and Railway Engineering
Program Leader, ARC Centre of Excellence for Geotechnical Science and Engineering, University of Wollongong, Australia
FTSE, FIEAust, FASCE, FGS, CEng, CPEng, DIC.

Prof. Buddhima Indraratna is a graduate in Civil Engineering from Imperial College, University of London, and completed his PhD in Geotechnical Engineering at University of Alberta, Canada. Having worked in Civil Engineering Industry for a number of years, he decided to join academia. Currently he is Professor of Civil Engineering at University of Wollongong, Australia, and Research Director of the Centre for Geomechanics and Railway Engineering. Prof. Indraratna has been an active geotechnical consultant and a UNDP expert for various geotechnical projects in both Australia and overseas.

Prof. Indraratna was a recipient of Swedish Geotechnical Society award in 1999, Robert Quigley Honourable award from the Canadian Geotechnical Society in 2007 and IACMAG Excellent Contributions Award in 2008.

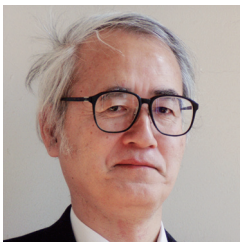
In 2009, Prof. Indraratna was honoured by the Business and Higher Education Round Table award for Outstanding Contributions to Rail Innovations by the Australian Commonwealth Government. In 2010, he delivered the E.H. Davis Memorial Lecture of the Australian Geomechanics Society for his distinguished contributions from Theory to Practice in Geotechnical Engineering. In 2011, he was awarded the prestigious Transport Medal by Engineers Australia for his contributions to transport infrastructure engineering.

Prof. Indraratna has been a Keynote Speaker and Invited Guest Lecturer at over 30 international conferences. He has published over 400 articles in refereed journals and conferences, and is the author of 5 books. He has supervised about 40 PhD students and 20 Postdoctoral Fellows in his career thus far.

Prof. Indraratna is a Fellow of the Australian Academy of Technological Sciences and Engineering, Fellow of Institution of Engineers Australia, Fellow of American Society of Civil Engineers and Fellow of the Geological Society, United Kingdom.

13:00-14:15, Tuesday, September 11

GRS Structures Recently Developed and Constructed for Railways and Roads in Japan



Prof. Fumio TATSUOKA

Tokyo University of Science, Japan
Immediate Past President of International Geosynthetics Society

Prof. Tatsuoka graduated from University of Tokyo 1968 and obtained a degree of doctor 1973. After working for the Ministry of Construction, the Japanese Government, 1977, he became Associate Professor of University of Tokyo and then Professor. 2004, he moved to Tokyo University of Science. His domestic and international society activities include Editor of Soils and Foundations, Vice President of the Japanese Society for Civil Engineers, Vice President and President of the Japanese Geotechnical Society, Vice President of the International Society for Soil Mechanics and Foundation Engineering and Vice President and President of the International Geosynthetics Society.

His major research interests are laboratory tests of geomaterials; deformation and strength characteristics, including rate and ageing effects, of geomaterials; foundation engineering, including bearing capacity of shallow foundations and stability of retaining walls; and ground improvement by cement-mixing and soil reinforcing with geosynthetics.

He wrote more than 450 technical papers in Soils and Foundations, Geotechnical Testing Journal, Géotechnique, Journal of Geotechnical and Environment Engineering, Geosynthetics International, Geotextiles and Geomembranes and other. He did the 1996-1997 Mercer Lecture of the International Society of Soil Mechanics and Geotechnical Engineering on “Geosynthetic-Reinforced Soil Retaining Walls as Important Permanent Structures. 2011, in Seoul, he did the first Bishop Lecture on “Laboratory stress-strain tests for developments in geotechnical engineering research and practice” on the occasion of 5th International Symposium on Deformation Characteristics of Geomaterials organized by TC29 (currently TC101) of ISSMGE.

He received a number of awards, including the International Geosynthetics Society Award for “Development of geosynthetic-reinforced soil retaining wall system having staged-constructed full-height rigid facing”, the Hogentoglar Awards from ASTM two times for the papers “Importance of Measuring Local Strains in Cyclic Triaxial Tests on Granular Materials” and “A triaxial testing system to evaluate stress-strain behavior of soils for wide range of strain and strain rate”.

14:15-15:00, Tuesday, September 11

Sustainable Pavement Construction Utilizing Engineered Unbound Aggregate Layers

Prof. Erol TUTUMLUER

Paul F. Kent Endowed Faculty Scholar
Director of International Programs
Department of Civil and Environmental Engineering
University of Illinois at Urbana-Champaign, USA

Erol Tutumluer holds a B.S. (Bogazici University 1989), two M.S. degrees (Duke University 1991 and Georgia Tech 1993), and a Ph.D. (Georgia Tech 1995), all in civil engineering. Dr. Tutumluer is a transportation/geotechnical engineering professor and Paul F. Kent Endowed Faculty Scholar of Civil and Environmental Engineering (CEE) at the University of Illinois at Urbana-Champaign (UIUC). Professor Tutumluer has taught graduate and undergraduate courses in transportation soils engineering, subgrade soil and aggregate behavior and stabilization, introduction to transportation engineering, pavement analysis and design, and airport facilities design at the University of Illinois since 1996.

Dr. Tutumluer has research interests and expertise in transportation geotechnics, specifically testing and modeling of pavement and railroad track geo-materials, i.e., base/ballast unbound aggregates; recycled aggregates and their unbound applications, shape, texture, angularity characterization of aggregates using imaging and laser techniques, use of geosynthetics in pavements/railroad track, modeling of particulate media using discrete and finite element methods, artificial intelligence in the form of neural network modeling, mechanistic based pavement design, and nondestructive pavement evaluation. He has authored and co-authored over 190 technical papers in these areas.

Dr. Tutumluer is currently the Chair of the ASCE Geo-Institute's Pavements Committee. As an active affiliate of Transportation Research Board (TRB), Dr. Tutumluer was the 2000 recipient of the TRB's Fred Burgraff award for Excellence in Transportation Research and more recently, he was the 2009 recipient of the TRB's Geology and Properties of Earth Materials Section best paper award for his paper on nondestructive evaluation of constructed unbound aggregate layers. Dr. Tutumluer is currently the Chair of the AFP70 Mineral Aggregates TRB Committee.

Dr. Tutumluer is an Associate Editor of the ASCE Journal of Computing and International Journal of Pavement Research and Technology. In addition, he currently serves on the Editorial Boards for the ASCE International Journal of Geomechanics and the International Journal of Pavement Engineering (Taylor and Francis Group). Recently, Dr. Tutumluer served as the Conference Chair and Proceedings Co-editor of the 8th International Conference on the Bearing Capacity of Roads, Railways and Airfields (BCR2A'09) which was held at UIUC on June 29-July 2, 2009 (http://www.BCR2A.org).

9:30-10:15, Wednesday, September 12

Bituminous Mixtures: from Thermo-mechanical Properties of Components to Structure Calculation

Prof. Hervé DI BENEDETTO

University of Lyon, ENTPE, DGCB & LTDS (CNRS 5513), France

Professor Hervé Di Benedetto received his Diploma of Civil Engineer from the "Ecole Nationale des TPE" (ENTPE) in 1979. He is Doctor of Engineering in Soil Mechanics (1981) and "Docteur ès-Sciences" (1987), both from the University of Grenoble, France. Currently he is Professor at ENTPE, University of Lyon.

Prof. Di Benedetto's research focuses on the study of mechanical, thermo-mechanical and structural behaviour of geomaterials, including experimental and modelling aspects. He is working in the fields of soils mechanics and road engineering.

He has been the supervisor of more than 40 PhD students and of a large volume of research works in collaboration with various private and public partners. He is author of more than 160 publications.

Prof. Di Benedetto has been frequently Invited or Keynote Speaker for conferences. He is the present Chair of TC 101 "Laboratory testing" of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), first vice Chair of the International Society of Asphalt Pavements (ISAP) and Editor-in-Chief of the International Journal "Road Materials and Pavement Design"(http://www.tandfonline.com/loi/trmp20).

13:30-14:15, Wednesday, September 12

Soil Suction Measurements in Highway Subgrades

Prof. Delwyn G. FREDLUND

Golder Associates Ltd, Saskatoon, SK., Canada

Delwyn G. Fredlund has spent over 40 years conducting research into the behaviour of unsaturated soils. Most of his career was spent at the University of Saskatchewan, Saskatoon, where he organized the Unsaturated Soils Group for research into all aspects of unsaturated soils behavior. Presently Del heads the Golder Unsaturated Soils Group linking the worldwide offices of Golder Associates.

Del Fredlund obtained his MSc degree in 1964 and his PhD degree in 1973 from the University of Alberta, Edmonton. In 1966 Del Fredlund accepted a position in the Department of Civil Engineering at the University of Saskatchewan, Saskatoon, Canada. He became the Head of the Department of Civil Engineering at the University of Saskatchewan from 1989 to 1994. He has also been appointed as an Adjunct Professor at a number of national and international universities.

Dr. Fredlund is the author along with Dr. Harianto Rahardjo of the book “Soil Mechanics for Unsaturated Soils”, published in 1993. A new book titled “Unsaturated Soil Mechanics for Engineering Practice” was published in 2012 with Dr. Rahardjo and his son, Murray Fredlund of SoilVision Systems. Dr. Fredlund has published approximately 500 journal and conference research papers.

Dr. Fredlund has been the recipient of numerous awards, among them the Terzaghi Award, 2005, given by the American Society for Civil Engineering and has been the recipient of the Order of Canada, 2004, from the Federal Government of Canada for his significant contribution to Canada and other countries around the world. He is also a member of the Canadian Academy of Engineering. Dr. Fredlund has also undertaken international programs of collaboration with countries such as China, Africa and Vietnam.

Day 1 September 10

10:00-11:00 **Opening Ceremony**

11:00-12:00 **Special Lecture**

Chair: K. Sato

"Trends and Challenges in Earthworks for Transportation Infrastructures"
A. Gomes Correia, J.-P. Magnan

12:00-13:30 Lunch

13:30-15:00 **TS-1A: Laboratory Testing and In-situ Testing (1) (Room A)**

Chair: D. Cameron, Secretary: T. Mikami

In-situ measurement of damping ratio spectra from the inversion of phase velocities of P and S waves in cross-hole seismic testing
C.G. Lai, A.G. Özcebe

An innovative approach for continuous measurement of cemented sand stiffness immediately after layer compaction
J. Silva, M. Azenha, A.G. Correia

Development of medium-size triaxial apparatus for unsaturated granular base course materials
T. Ishikawa, Y. Zhang, H. Segawa, S. Miura, T. Tokoro

Large-scale triaxial tests of dense gravel material at low confining pressure
S. Lenart, J. Koseki, T. Sato, Y. Miyashita, H.V. Thang

Fundamental study on the simple evaluation methods for particle size distribution and maximum/minimum void ratio of sand-gravel mixtures
G.H.A.J.J. Kumara, K. Hayano, K. Ogiwara, M. Takeuchi

Improving the use of unbound granular materials in railway sub-ballast layer
E. Fortunato, A. Paixão, S. Fontul

Full scale model tests on slab track constructed on embankment
H. Jiang, X. Bian, Y. Chen, J. Jiang

13:30-15:00 **TS-1B: Geotechnics for Pavement, Rail Track and Airfield (1) (Room B)**

Chair: S. Nazarian, Secretary: E. Hirotsu

Effects of lime content and amelioration period in double lime application on the strength of lime treated expansive sub-grade soils
C. Gallage, M. Cochrane, J. Ramanujam

Analysis of traffic-load-induced permanent settlement of highway embankment on soft clay ground
M. Huang, Z. Yao

Characterization of highly compressible marine clay for road foundation
G.W. Chai, N. Mosavat, E.Y. Oh, Y.C. Loo

A prediction method of plastic deformation development of subbase and subgrade in concrete pavement
T. Nishizawa

Full-scale accelerated loading test for load distribution on subgrade due to CFA stabilized base
K. Tomisawa, T. Endoh, H. Godenki, T. Okabe, T. Kanai

Evaluation of the mechanical characteristics of recycled base layers produced by Full Depth Reclamation (FDR)
J. Depatie, J.-P. Bilodeau, G. Doré

Characterization of hydrated cement treated crushed rock base as a road base material in Western Australia using disturbed state concept
P. Khobklang, V. Vimonsatit, P. Jitsangiam, H. Nikraz

13:30-15:00 **TS-1C: Earthworks for Transportation Facilities (Room C)**

Chair: S. Chao, Secretary: T. Tokoro

The effect of dry unit weight, suction, and imparted energy on the modulus of a compacted mixture of sand and kaolin
C. Rujikiatkamjorn, A. Heitor, B. Indraratna

A study on increased layer thickness for embankment construction using ordinary compaction machinery
T. Adachi, S. Nishimoto, A. Satoh

Proposal of control criteria for embankment compaction in Hokkaido
A. Sato, S. Nishimoto, T. Suzuki

Relationship between compaction equipment and compaction results
M. Yamada, S. Nishimoto, A. Sato

Influence of the drainage in the reinforced soil wall during seepage flow
M. Kobayashi, K. Miura, T. Konami

A study on the structural assessment of pavement damaged by the Tohoku Earthquake and liquefaction and causes of the damages
N. Abe

Numerical study on dynamic interaction between embankment and consecutive culverts
Y. Sawamura, K. Kishida, M. Kimura

13:30-15:00 **TS-1D: Asphalt Mixtures and Hydraulically-bound Materials (Room D)**

Chair: K. Kamiya, Secretary: N. Kawamura

Effects of mineral fillers on rheological properties of asphalt binders
A.D. Mwanza, P. Hao, H. Hui

Behaviour of asphalt mixture under large amplitude cyclic loading
Q.T. Nguyen, H. DiBenedetto, C. Sauzéat

New X-ray CT evaluation method of engineering characteristics of asphalt mixture
S. Taniguchi, I. Nishizaki, K. Ogawa, J. Otani

Effect of water on the strength of bituminous mixes with waste concrete aggregates
M.A. Sobhan, S.A. Mofiz, T. Humyra, M.R. Awall

Interpretation and application of repeated torsional shear test on asphalt mixtures
N. Yoshida, A. Fuke, T. Uehara, K. Adachi

Characterization of emulsion bitumen stabilized aggregate base
M. Moaveni, I. Abuawad, K. Hasiba, D. Zhang, E. Tutumluer

A study of developing new tests to evaluate compaction property and deformation resistance for slipform paving concrete
S. Yokota, T. Sato, R. Kamishita, K. Nakamura, O. Kamada, Y. Sakamoto

Influences of in situ HMA compaction on its performances
Y. Hachiya, K. Kitaochi, T. Watanabe

15:00-15:30 Break

15:30-17:00 **TS-2A: Laboratory Testing and In-situ Testing (2) (Room A)**

Chair: S. Yamashita, Secretary: T. Okabe

Characteristics of in-situ dynamic stresses of pavement subgrade under portable falling weight deflectometer test
G.L.M. Leung, Y.H. Wang, A.W.G.Wong

Shakedown behavior of unbound granular material under repeated portable FWD loading
M. Kamiura

Influence of underground structures on cavity formation due to various conditions of water flow
M. Sato, R. Kuwano

The influence of moisture on the detection of de-bonding in asphalt pavements using Ground Penetrating Radar (GPR)
R.D. Evans, M. Rahman

Characterization of polymer modified asphalt for rutting and cracking potential using dynamic shear rheometer
M.A. Javid, M.W. Mirza

Measurement of the deformation behavior of asphalt mixture by using a high-speed camera
Y. Hisari, S. Yokota, K. Takehara

15:30-17:00 **TS-2B: Geotechnics for Pavement, Rail Track and Airfield (2) (Room B)**

Chair: E. Tutumluer, Secretary: S. Kawamura

The use of recycled crushed concrete as a road base material
J.N. Greitschus

Effects of freeze-thawing on mechanical behavior of granular base in cold regions
T. Ishikawa, S. Kawabata, S. Kameyama, R. Abe, T. Ono

Study of suction in unsaturated soils applied to pavement mechanics
B.A. Silva, L.M.G. Motta

Cracking and flexural behaviors on cement treated crushed rock for thin flexible pavement
K. Siripun, P. Jitsangiam, H. Nikraz, C. Leek

Role of resilient modulus constitutive models on response of pavements
M. Mazari, E. Navarro, I. Abdallah, S. Nazarian

Effects of the environment-conscious pavements in Fukuoka University and its verification
K. Sato

Failure on a roadside dip slope with partial anchorage system
H. Wang, J.-J. Hung

15:30-17:00 **TS-2C: Design, Construction and Maintenance (1) (Room C)**

Chair: S.-W. Park, Secretary: T. Kawaguchi

Effect of traffic overloading and stiffness of unbound aggregates on pavement performance
A. Shafeeq, Y. Kohata, Y. Takeuchi

A conceptual model for reliability analysis of pavement foundations
A. Teixeira, A.G. Correia, A. Gaspar, A.A. Henriques, Y. Honjo

Proposal of maintenance options to meet the pavement failure characteristics in Bangladesh
M.R. Islam, K. Hayano

A study on materials and environmental conditions for mechanistic-empirical design method of asphalt pavement in cold snowy regions
R. Abe, M. Kumagai, K. Maruyama

The dynamic analysis to human-vehicle-road system for bump at the end of bridge
J.-H. Jung, M.S. Nam

Railway track stiffness measurements at bridge transition zones
H. Luomala, A. Nurmikolu

15:30-17:00 **TS-2D: Application of Geosynthetics (Room D)**

Chair: J. Otani, Secretary: Y. Miyata

Rural road maintenance using geotextile available in developing countries
M. Kimura, Y. Fukubayashi

Performance of a Bearing Reinforcement Earth (BRE) wall and its numerical simulation
S. Horpibulsuk, C. Suksiripattanapong, A. Chinkulkijniwat, T. Tangsutthinon, W. Bunyakiat

Effects of subbase geogrid reinforcement on residual deformation characteristics of asphalt pavement
D. Hirakawa, Y. Miyata

Effect of geosynthetic drainage layers on the recovery rate of pavement surface modulus
C. Savoie, G. Doré, J.-P. Bilodeau, J. Fachon

Monitoring and predicting the seismic behaviors of geosynthetic reinforced soil retaining structures
S.J. Chao, A. Cheng, C.Y. Chan, J.R. Chang

Seismic performance of geotextile reinforced soil wall with double facing system
S. Tsuji, N. Tatta, Z. Wang, T. Kubo, K. Arai

17:00-17:30 Break

17:30-19:00 **TS-3A: Laboratory Testing and In-situ Testing (3) (Room A)**

Chair: H. Di Benedetto, Secretary: D. Hirakawa

Determination of air-entry value for different compacted unsaturated soil
T. Nishimura, J. Koseki, H. Rahardjo

Intact soft clay responses to cyclic principal stress rotation in undrained condition
J. Zhou, J. Yan, Y. Cao, X. Gong

Accumulation of excess pore water pressure and post-cyclic settlement of saturated soft clay subjected to multi-directional cyclic simple shear
H. Matsuda, T.T. Nhan, R. Ishikura, A.P. Hendrawan

Experimental study on responses of saturated clay to traffic loading
J.G. Qian, S.B. Guo, M.S. Huang, J.F. Zhang

A study on cyclic triaxial test method for coarse granular materials
S.J. Lee, I.W. Lee, S.H. Lee, J.W. Lee, S.H. Lee

Solidification of dredged marine clay under varied mix conditions: A laboratory Study
C.-M. Chan, Y. Kikuchi, T. Mizutani

17:30-19:00 **TS-3B: Geotechnics for Pavement, Rail Track and Airfield (3) (Room B)**

Chair: P. Woodward, Secretary: K. Muramoto

Establishing linkages between ballast degradation and imaging based aggregate particle shape, texture and angularity indices
H. Boler, M. Wnek, E. Tutumluer

Influence of moisture content on cyclic plastic deformation characteristics of recycled crusher-run material under moving wheel loads
A. Inam, T. Ishikawa, S. Miura

Evaluation of train running stability on slab track with vibration exciter
M. Shinoda, H. Sakamoto, N. Misaki, Y. Sakamoto

Development of integrated RC roadbed for slab track on clay subgrade
Y. Momoya, T. Takahashi, O. Maruyama, E. Sekine

Railroad foundations—verifications and analysis of the dynamic stability
M. Raithel, E. Leusink

Evaluation of a linear elastic 3D FEM to simulate rail track response under a high-speed train
J. Cunha, A.G. Correia

17:30-19:00 **TS-3C: Design, Construction and Maintenance (2) (Room C)**

Chair: M. Kimura, Secretary: S. Tsuji

Design and construction of deep excavation engineering adjacent to the subway tunnel in Shanghai soft soil
J. Li, W. Wang, K. Tan

Transportation infrastructure on soft sensitive clays: Some essential aspects and examples
V. Thakur, F. Oset, S.A. Degago, R. Aabøe, A. Watn

Limerick Tunnel approach roads – geotechnical design & performance of bridge transitions
F.J. Buggy

Design loads on railway substructure – comparative parametric investigation on the influence of fastening stiffness (European and Japanese)
K. Giannakos

Quality assessment of high water content embankment slope based on compaction energy
S. Manandhar, N. Yasufuku, T. Kobayashi, M. Taniyama

Challenges for transportation geotechnics in extreme climates of Kazakhstan and Korea
A. Zhussupbekov, Zh. Shakhmov, E.C. Shin, S. Krasnikov

19:30-20:30 **Welcome Party at Restaurant "Elm" in Hokkaido University**

Day 2 September 11

9:30-10:15 **Keynote Lecture (Room A)**

Chair: K. Sato

Performance Evaluation of Shock Mats and Synthetic Grids in the Improvement of Rail Ballast
B. Indraratna, S. Nimbalkar, C. Rujikiatkamjorn

10:15-10:45 Break

10:45-12:15 **TS-4A: Risk Assesment and Environmental Issues (1) (Room A)**

Chair: Y. Kikuchi, Secretary: S. Nakajima

Internal erosion in dikes alongside roads and railways
J. Monnet, O. Plé, D.M. Nguyen

Stability evaluation of soft cliff subjected to wave erosion
S. Kawamura, S. Miura

Analysis of ground loosening behaviour in expansion of underground cavities: Laboratory experiments in sandy soil
I.H.S. Renuka, R. Kuwano, T. Sato

Mineral barriers against natural contamination from excavated rocks
A. Naka, T. Katsumi, G. Flores, T. Inui, A. Takai, T. Ohta

Modeling of transportation and leaching behaviour of contaminants in stabilized tailings
R.P. Mapinduzi, P.M. Bujulu, W. Mwegoha

10:45-12:15 **TS-4B: Geotechnics for Pavement, Rail Track and Airfield (4) (Room B)**

Chair: B. Indraratna, Secretary: Y. Momoya

Effect of ground properties and embankment height on the embankment failure behavior during earthquake
M. Ohki, M. Seki, T. Sakai, M. Nakano

Laboratory tests on a ballasted rail track reinforced by geosynthetics
L. Briançon, C. Cojean, N. Calon, S.C. d'Aguiar, A. Robinet

Modelling and application of polyurethane geocomposites for high-speed ballasted railway tracks including transition zone dynamics
P.K. Woodward, A. Kacimi, O. Laghrouche, G. Medero

Study on the settlement characteristics and reinforcement technology of unsaturated soil ground of high-speed railway
L. Wu, G. Jiang

Improvement of rail track subgrade using stone columns combined with geosynthetics
B. Fatahi, H. Khabbaz, T.M. Le

Design method for railway bases reinforced with geogrid
P. Rimoldi

10:45-12:15 **TS-4C: Modeling and Numerical Simulations (1) (Room C)**

Chair: E. Fortunato, Secretary: Y. Miyata

3D-DEM simulation for shaking table test of ballasted test track
A. Kono, T. Matsushima

Investigating geogrid-reinforced ballast using laboratory pull-out tests and discrete element modelling
C. Chen, G.R. McDowell, N.H. Thom

Shear strain development and pore pressure distribution in sandy model slope under repeated rainfall
K. Sasahara, N. Sakai

Modelling cemented sand using DEM
J.P. de Bono, G.R. McDowell, D. Wanatowski

Discrete element modeling of asphalt mixture
W. Cai, G.R. McDowell, A.C. Collop, G.D. Airey

Influence of the soil properties variability on the railway track response under moving load
V.A. Fernandes, S.C. D'Aguiar, F. Lopez-Caballero

Numerical modeling of "soil-mixing" columns used for railway subgrade reinforcement
S.C. D'Aguiar, M. Diagne, N. Calon

12:15-13:30 Lunch

13:30-15:00 **Keynote Lecture (Room A)**

Chair: K. Sato

GRS Structures Recently Developed and Constructed for Railways and Roads in Japan
F. Tatsuoka, M. Tateyama, J. Koseki

Sustainable Pavement Construction Utilizing Engineered Unbound Aggregate Layers
T. Tutumluer

15:00-15:30 Break

15:30-16:30 **TS-5A: Risk Assesment and Environmental Issues (2) (Room A)**

Chair: N. Yasufuku, Secretary: E. Hirotsu

Evaluation of soil liquefaction potential along Tabriz Metro Line 2 based on Idriss-Boulanger and Japanese Highway Bridges methods
E.A. Kaljahi, M. Babazadeh

Soil liquefaction vulnerability mapping due to seismic activity using geo-statistics, GIS and geotechnical data
B. Md. Habibullah, J. Kuwano, S. Tachibana, S. Yamaoka

Rainfall characteristics inducing shallow failure on road slope in Korea
K.S. Kim, C.K. Chung

An appropriate stress test to estimate the long term performances of high speed rail structures
M. Preteseille, P. Hornych, T. Lenoir

15:30-16:30 **TS-5B: Geotechnics for Pavement, Rail Track and Airfield (5) (Room B)**

Chair: Y. Hachiya, Secretary: K. Hayano

Determination method of ground model for reclaimed land with dredged clay and evaluation by settlement record of Kita-Kyushu Airport
H. Yoshida, H. Kume, S. Yamamoto, M. Katagiri, T. Yoshifuku, K. Ohishi, M. Terashi

Thick-layer construction using sandy soil as material and embankment performance evaluation: Assessment of rolling compaction test results
T. Sakaiya, T. Kuwahara, H. Takei, K. Umetsu

Jet grouting deformability modulus prediction using data mining tools
J. Tinoco, A.G. Correia, P. Cortez

Development of high durable grout for airport prestressed concrete pavement
N. Kawamura, R. Maekawa, K. Morohashi, A. Shiji, K. Kamitani

Seismic damage assessment of an airport runway based on non-linear FEM analysis with special reference to crack occurrence
Y. Hata, K. Ichii, A. Nozu

15:30-16:30 **TS-5C: Modeling and Numerical Simulations (3) (Room C)**

Chair: Y. Kohata, Secretary: M. Shinoda

Numerical analysis of settlements at bridge approaches
M.S. Nam, J.-H. Jung

The use of geotechnical instrumentation and finite element analysis for assessment of bridge foundation stability due to breccia resliding over clayshale
P.P. Rahardjo, Y. Halim, H. Wisanto

Dynamic response for critical velocity effect depending on track supporting stiffness
I.W. Lee, S.J. Lee, S.H. Lee

Comparison between a 3-D finite element pavement model and the mechanistic-empirical pavement design guide for asphalt pavements
S. Im, H. Ban, Y.-R. Kim, S.-W. Park

Effect of deformed wick drain in soft ground improvement for embankments in Vietnam
H.-H. Tran-Nguyen, H.H. Ha

16:30-17:00 Break

17:00-18:00 **Special Lecture (Room A)**

Chair: K. Sato

Mechanical Behavior and Earthquake-induced Failures of Volcanic Soils in Japan
S. Miura

19:30-21:30 **Banquet at Sapporo Grand Hotel**

Day 3 September 12

9:30-10:15 **Keynote Lecture (Room A)**

Chair: K. Sato

Bituminous Mixtures: from Thermo-mechanical Properties of Components to Structure Calculation
H. Di Benedetto

10:15-10:45 Break

10:45-12:15 **TS-6A: Laboratory Testing and In-situ Testing (4) (Room A)**

Chair: J. Qian, Secretary: S. Nishimura

A study on the design of highway bridge pile foundations in volcanic ash ground
K. Tomisawa, T. Egawa, S. Miura

Influence of reclaimed materials on base course quality
K. Kubo, M. Itani, S. Horiuchi

The case studies of damage investigation of the 2011 East Japan earthquake disaster using the vehicle for exploring under roads by GPR
Y. Yamashita, A. Matsuyama, H. Murakami

Surface free energy components of aggregates from contact angle measurements using Sessile Drop method
M. Koc, R. Bulut

Geotechnical behavior of cement treated soils from southern coast line of Caspian Sea
P. Sedighi, A. Eslami

10:45-12:15 **TS-6B: Geomaterial, including Nontraditional Materials (1) (Room B)**

Chair: N. Yoshida, Secretary: A. Higatani

Mechanical characteristics of composite geomaterial mixed with lightweight granular material
K. Yamanaka, K. Minegishi

Mechanical characteristics of foamed bitumen mixtures in Western Australia
Y. Huan, P. Jitsangiam, H. Nikraz, R. Grant

Blended recycled clay masonry and crushed concrete aggregate in bases
A.H. Azam, D.A. Cameron, M.M. Rahman

Recycled concrete aggregate as a base course material in Western Australian road
P. Jitsangiam, K. Siripun, H. Nikraz, C. Leek

Mechanical characteristics of hydrated cement treated crushed rock base for Western Australian road base
S. Chummuneerat, P. Jitsangiam, H. Nikraz

Experimental study on deformation characteristics of granular materials made from recycled glass bottles under traffic loading
T. Mikami, J. Koseki, T. Sato

Study on effect of mixing condition on strength of mixture of dredged soil and steel slag
S. Hirai, T. Mizutani, Y. Kikuchi, S. Nakashima, K. Iguchi

10:45-12:15 **TS-6C: Modeling and Numerical Simulations (2) (Room C)**

Chair: F. Oka, Secretary: K. Hayano

Innovative sleeper design analysis using DEM
J.-F. Ferellec, G.R. McDowell

On 1G slope failure model tests due to rainfalls: Difference of failure patterns due to difference of densities of a subsurface sand layer
N. Tokoro, K. Tanikawa, H. Saito, Y. Kohgo, T. Hori

Physical model of surcharge loading to the intersecting ridge between two slopes
S. Thay, S. Kitakata, T. Pipatpongsa, A. Takahashi

Performance analysis of EPS test embankment
L. Korkiala-Tanttu, M. Juvankoski, H. Kivikoski

Shaking table test and effective stress analysis of bridge pile foundation with seismic isolation rubber in liquefied ground
K. Uno, M. Mitou, H. Otsuka

Centrifuge modelling of an embankment stabilised with discretely spaced reinforced concrete piles
T.J. Kelly, J.A. Knappett, R. Müller

Modelling of sand behavior in drained cyclic shear
L.I.N. De Silva, J. Koseki

12:15-13:30 Lunch

13:30-14:15 **Keynote Lecture (Room A)**

Chair: K. Sato

Soil Suction Measurements in Highway Subgrades
D. G. Fredlund, Q. Nguyen

14:15-14:45 Break

14:45-16:15 **TS-7A: Performance Evaluation and Quality Control (Room A)**

Chair: K. Kubo, Secretary: O. Kamada

A study on repair design method of porous asphalt for the Japanese motorways
K. Kamiya, T. Kazato

Performance of the double layered D-mix pavement
E. Hirotsu

Permanent strain testing of recycled concrete aggregate for evaluation of unbound bases
D.A. Cameron, A.R. Gabr

Trafficability during thaw on minor roads in Finland
S. Saarelainen, H. Gustavsson

Effectiveness of geotextiles in unsurfaced pavements over weak subgrade evaluated from accelerated field testing
D. Mishra, E. Tutumluer

14:45-16:15 **TS-7B: Geomaterial, including Nontraditional Materials (2) (Room B)**

Chair: K. Sato, Secretary: M. Yamaki

Improvement of swelling-collapsible behaviors of silty clay by calcium carbide residue
A. Kumpala, S. Horpibulsuk, J. Suebsuk

Evaluation of non-traditional stabilizers with silty-clay desert soil
A. Bayat, O. Farzaneh

Performance assessment of clay soil stabilized with recycled gypsum based on SEM and XRD
A. Ahmed, M. Kobayashi, K. Ugai

A method for accelerating the solidification of granulated blast furnace slag
Y. Kikuchi, T. Mizutani, S. Oka, K. Nakashima

Effects of compaction condition on seismic performance of dike embankment and its evaluation
S. Matsumura, S. Miura, S. Yokohama

Change in mechanical characteristics of embankment material by compaction control and its evaluation
S. Yokohama, S. Miura, S. Matsumura

Dynamic centrifuge model tests on quay wall backfilled with granular treated soil
Y. Morikawa, H. Takahashi, K. Hayano, Y. Okusa

Characterization of gold mine tailings for utilization in development of the rural infrastructure
F.K. Mutabazi, P.M. Bujulu

14:45-16:15 **TS-7C: Sustainability of Management and Rehabilitation (Room C)**

Chair: T. Ono, Secretary: Y. Momoya

Analytical redesign potential of flexible pavements utilizing the in-situ characteristics of unbound materials
A. Loizos, C. Plati, V. Papavasiliou

Pavement maintenance management on the Hanshin Expressway network
A. Higatani, K. Sasaki, N. Hamada, Y. Hisari

Study on inspection method for railway existing retaining walls using vibration testing
S. Nakajima, M. Shinoda, K. Abe, T. Mai , T. Ehara

D-runway construction in Tokyo Haneda Airport–Hybrid structure of piled pier and reclamation fill
Y. Watabe, T. Noguchi

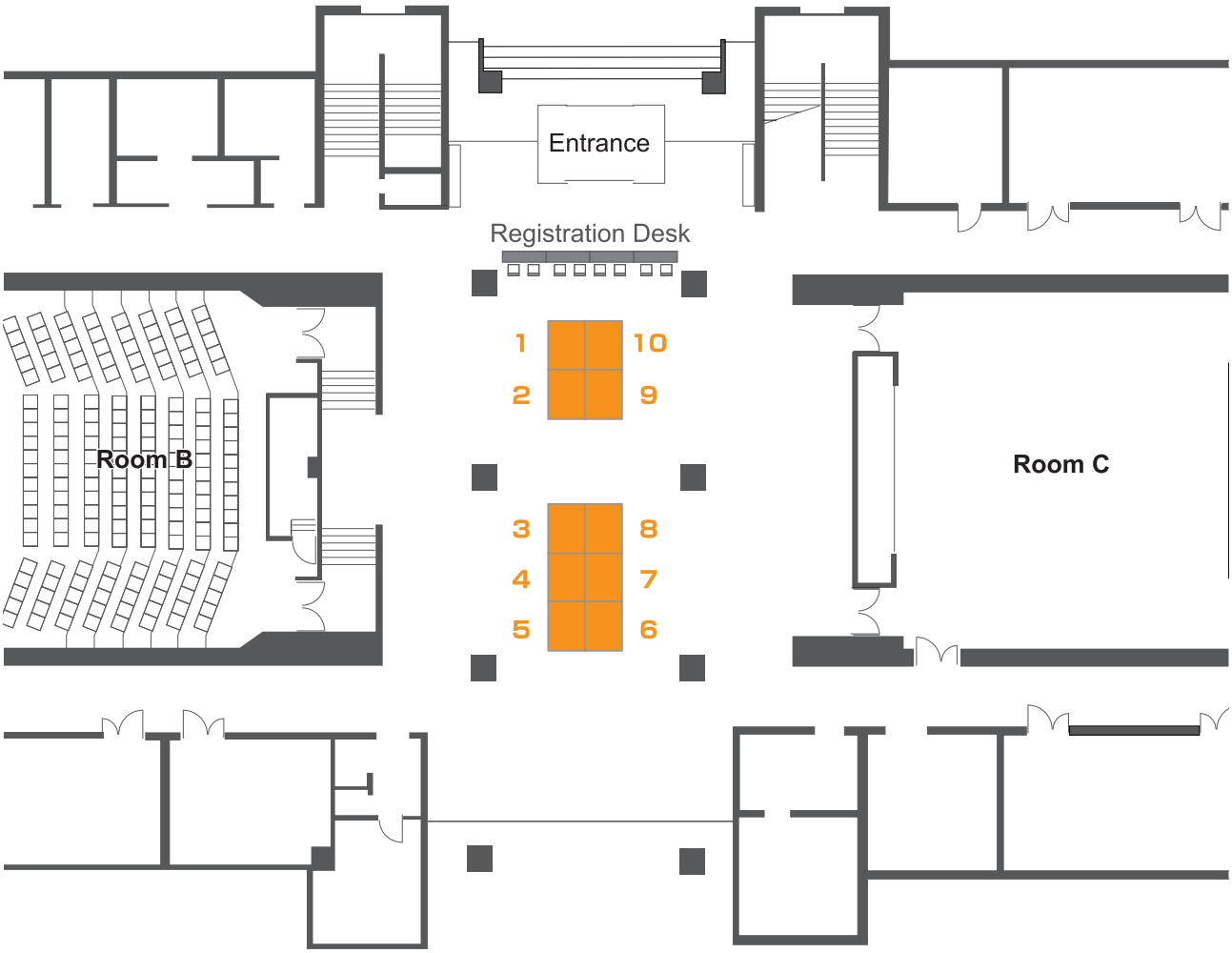
16:15-16:30 Break

16:30-17:00 **Closing**

Exhibition

Exhibition Period:

11:00-17:30, Monday, September 10
10:00-17:00, Tuesday, September 11
10:00-15:00, Wednesday, September 12



1. Maeda Kosen Co., Ltd.
2. East Nippon Expressway Co., Ltd. Hokkaido Regional Head Office
3-4. Civil Engineering Research Institute for Cold Region, PWRI
5. Dainippon Plastics Co., Ltd.
6. The Association of RRR Construction System
7. Hokkaido Electric Power Co., Inc.
8. Tokyo Sokki Kenkyujo Co., Ltd.
9. Port and Airport Research Institute
10. Mitsui Chemicals Industrial Products Ltd.

Workshops

Date	September 9, 2012
Time	Workshop 1 13:30 - 17:20, Workshop 2 13:30-15:30, Workshop 3 16:00-18:00
Venue	L Plaza (Sapporo Center for Gender Equality), Sapporo, Hokkaido, Japan
	For location, see page 32

Workshop 1

Intelligent Compaction (IC)

"Intelligent compaction" is the advanced soil compaction in which the construction and the site management are sophisticated with modern information communication technologies. The ground evaluation system through the vibrating behavior of a vibratory roller is one of the representative techniques in the intelligent soil compaction. In the system, the degree of soil compaction can be grasped by monitoring its vibrating behavior which changes with the increase of the ground stiffness during soil compaction. The intelligent compaction has been introduced widely in the world, because the stiffness of the compacted soil can be monitored in real-time on whole the site. In the workshop, the present conditions of the intelligent compaction will be reported on each region of Europe, North America and Japan and the results of other research projects will be presented by some participants.

PROGRAM

Chair: Prof. Kazuyoshi Tateyama (Ritsumeikan University, Japan)

13:30-15:30 State of the art reports on the Intelligent compaction
Europe: *Prof. A. Gomes Correia (University of Minho, Portugal)*
North America: *Dr. David White (Iowa State University, USA)*
Japan: *Dr. Hiroshi Furuya (Obayashi Corporation, Japan)*

16:00-17:00 General presentations on the Intelligent Compaction

17:00-17:20 Discussion

Workshop 2

Challenges for Transportation Geotechnics in Extreme Climates

This session will be divided into two categories. One is transportation geotechnics at low temperatures such as in cold regions or at high altitudes. Many road, rail road and air field structures are seriously damaged every year due to the freezing and thawing of soils and of the lower, unbound, materials beneath the pavement. Dr. Seppo Saarelainen, co-chair of TC216 on Frost, from Finland, will make a state-of-the-art report. The report will include frost protection design procedures in the Nordic countries, case studies from the European North and results from recent studies on the effect of future climate change on road systems in the North.

The other topic is about the effect of moisture on the behavior of soils and aggregates in transportation structures. Mr. Andrew Dawson from UK, chair of the European COST Action and editor of the reference book on “Water in Road Structures” will make a general report, addressing the effects that water can have on mechanical response, methods for measuring, analyzing and managing the condition and what effects pavements and associated earthworks may have to face in the light of climate change.

Presentations will be given by experts drawn from the TC members, with others, to stimulate participants’ interest.

PROGRAM

Chair: Dr. Seppo Saarelainen (Aalto University, Finland)

13:30-14:20 General report: Transportation geotechnics at low temperatures
Dr. Seppo Saarelainen (Aalto University, Finland)
Presentations and discussions

Chair: Mr. Andrew Dawson (University of Nottingham,UK)

14:20-15:10 General report: Effect of moisture on the behavior of soils and aggregates in transportation structures
Mr. Andrew Dawson (University of Nottingham,UK)
Presentations and discussions

15:10-15:30 Summarizing comments

Workshop 3

Geotechnical Challenges in Rail Track and its Transition Zones

Railway transition zones between different structures, especially embankment and bridge, are known to be an area in which problems often arise and where extra care is needed in inspections or maintenance work. In transition zones, local track irregularities easily occur due to differential settlement of structures or sudden change of the support rigidity causing various troubles of the track (hanging sleepers, ballast crush, mud pumping, fatigue of track parts, etc.). Furthermore, transition zones are weak against disasters, especially major earthquakes. Based on the above-mentioned problems, we expect to discuss the following keywords in the workshop: “High-speed lines” , “Heavy haul” , “Anti-seismic structures” , “Measure for existing lines” , “New track system for transition zone” and etc.

PROGRAM

Chair: Dr. Sofia Costa D'Aguiar (SNCF)

16:00-17:30 The state of the art
Prof. Peter Woodward (Heriot-Watt University, UK)
Prof. Konstantinos Giannakos (SALFO & Associates SA, Greece)
Dr. Yasuo Watanabe (East Japan Railway Company, Japan)
Dr. Kenji Watanabe (Railway Technical Research Institute, Japan)

17:30-18:00 Discussion

TOA ROAD CORPORATION President, Yoshitsugu OONISHI
7-3-7, Roppongi, Minato-ward, TOKYO, 106-0032, JAPAN.
TEL +81-3-3405-1810 FAX +81-3-3403-7689
Homepage : http://www.toadoro.co.jp, e-mail: info@toadoro.co.jp

Material for the Pavement

HS (High Stability) Asphalt Mixture is hot asphalt mix using hybrid modified asphalt using special thermoplastic resin and polymer. With both flexibility of polymer modified asphalt and rigidity of thermoplastic resin, HS Asphalt Mixture has high stability and durability against heavy loads. Its performance is equivalent to semi-flexible pavement and epoxy asphalt pavement. Also it has superior oil proofing and prevents deterioration from oil spill. It was used by the special thermoplastic resin and the polymer modified asphalt - type II (the special thermoplastic resin: polymer modified asphalt - type II = 25 : 75)

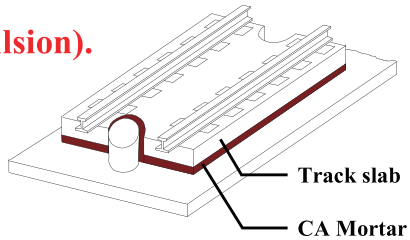
It is the polymer-modified asphalt of the pre-mix type which added a special thermoplastic-elastomer to the straight-asphalt. We change the addition of the SBS additive and response to a wide range of required performance.

The comparison of the Marshall specimen after oil spill

Material for the railway track

1. Concrete slab track filled layer (A-Emulsion).

The asphalt emulsion which constitutes cement asphalt mortar (CA Mortar) of concrete slab track.

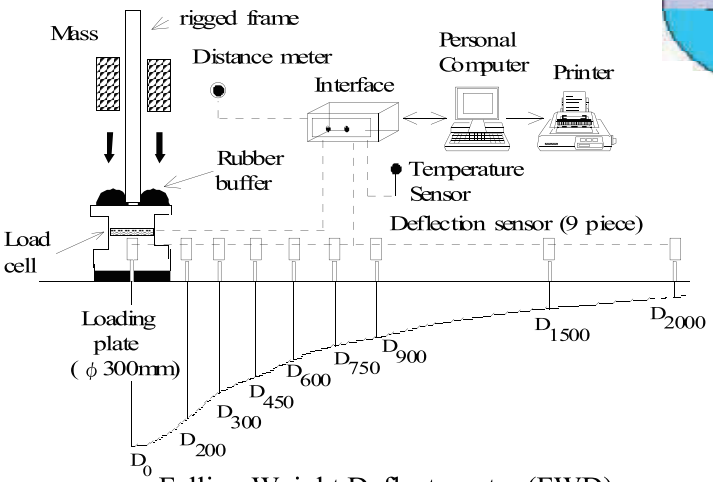


Bearing capacity evaluation system of the earth ground

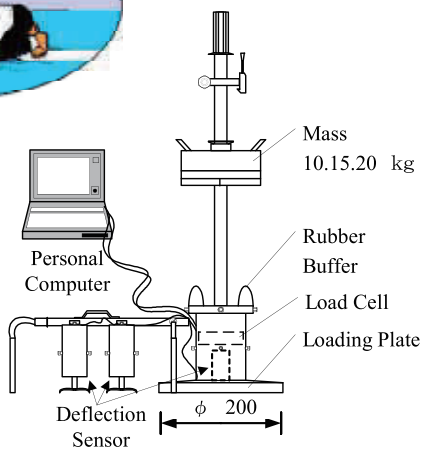
FWD and Portable FWD can evaluate the bearing capacity of the subbase course and the subgrade to which support the railway track and the road pavement.

Evaluation of a bearing capacity for the subgrade.

- E_{sg} : Elastic modulus (MPa)
- K_{FWD} : Modulus of subgrade reaction (MPa/m)
- CBR : in-situ CBR value (%)



Falling Weight Deflectometer (FWD)



Portable FWD

Memo

Sponsors

Thank you to our sponsors!

Hokkaido Regional Development Bureau
Ministry of Land, Infrastructure, Transport and Tourism
Government of Japan

Hokkaido Regional Development Bureau
Ministry of Land, Infrastructure and Transport and Tourism, Government of Japan

Association for Civil Engineering Technology of Hokkaido

JAPAN FEDERATION OF CONSTRUCTION CONTRACTORS
Japan Federation of Construction Contractors

Japan Road Association

Japan Road Contractors Association

Japan Society of Civil Engineers

Civil Engineering Research Institute for Cold Region, PWRI

Nippon Expressway Research Institute Company Limited

Port and Airport Research Institute

RAILWAY TECHNICAL RESEARCH INSTITUTE
Railway Technical Research Institute

City of Sapporo

Hokkaido Government

Thank you to our suppoters!

Hokkaido University

Geo-Institute of ASCE

International Geosynthetics Society

Transportation Research Board

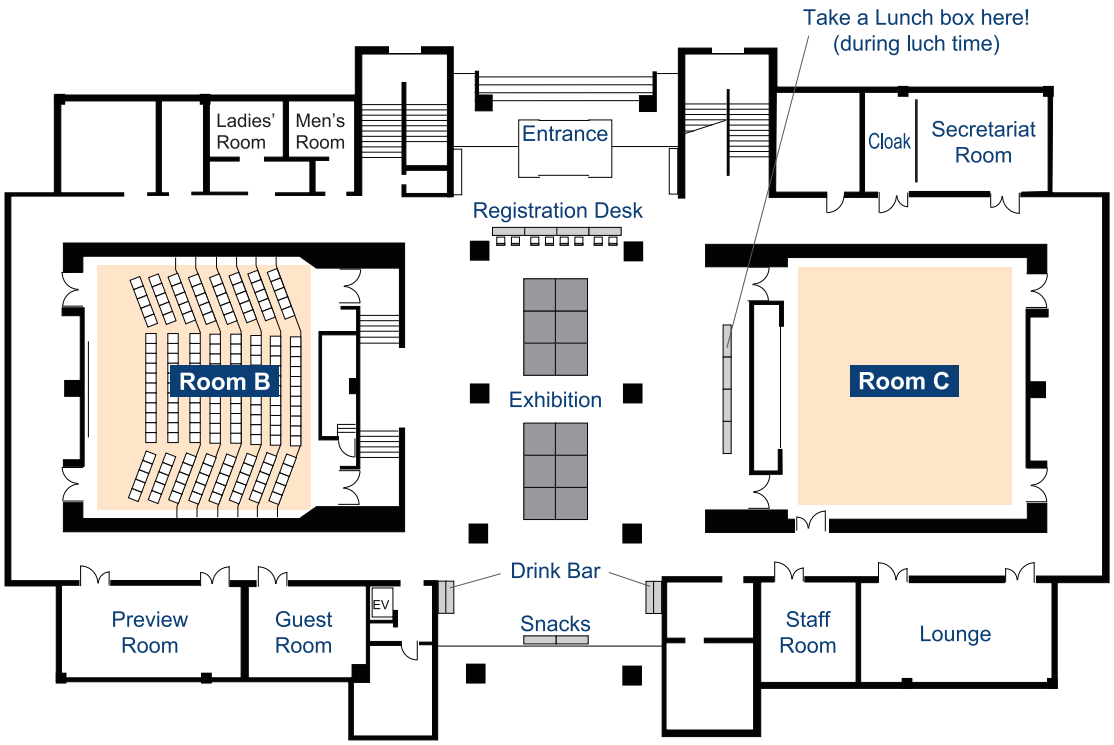
C-WAY ENGINEERING CO., LTD., DIA CONSULTANTS CO., LTD., DOCON CO., LTD., DOHROKOHGYOU CO., LTD.
E S GENERAL LABORATORY CO., LTD., HOKKAIDO CONSTRUCTION TECHNOLOGY CENTER
HOKUBU CONSULTANT CO., LTD., HR SOLUTIONS CORP., ISAMI CONSTRUCTION CO., LTD.,
IWAKURA CONSTRUCTION CO., LTD., KAJIMA CORPORATION, KATO CONSTRUCTION CO., LTD.
MASUMURA SURVEY-DESIGN INC., OBAYASHI CORPORATION, SHIMIZU CORPORATION, SHOWAMATERIAL CO., LTD.
TAISEI CORPORATION, TODA-ROAD CORPORATION, UEMURA CONSTRUCTION CO., LTD., YOSHIMOTOGUMI CO., LTD.


Ono Pond
Mid-Campus Open Laboratory
Faculty of Pharmaceutical Sciences
Faculty of Health Science
Restaurant "ELM"
Information Initiative Center
Graduate School of Education
The Hokkaido University Museum
Graduate School of Letters
Centennial Hall
Humanities and Social Sciences Classroom Building
Faculty of Public Policy
Slavic Research Center
Graduate School of Law
University Library
(Kyara-tei (cafeteria))
Graduate School of Economics and Business Administration
Furukawa Hall
Bust of Dr. William S. Clark
Central Lawn
Main Gate
Center for Ainu & Indigenous Studies
South Gate
Hokkaido University Co-op
Conference Hall
N

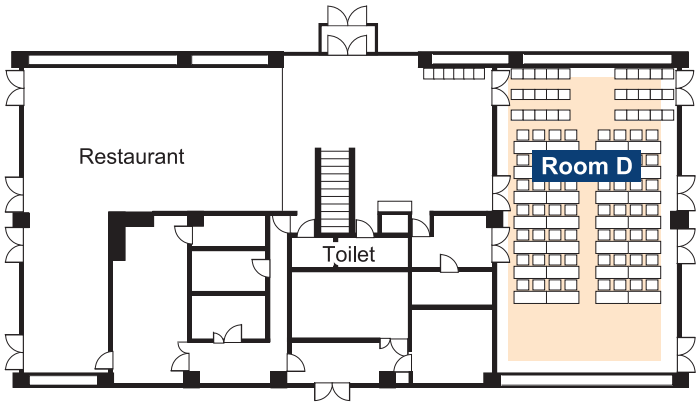

Centennial Hall
Subway Namboku Line
Subway Toho Line
L Plaza
(Sapporo Center for Gender Equality)
for Workshops
Main Gate
South Gate
Conference Hall
Kita 8-jo Street
North Exit
Yodobashi Camera
Sapporo Sta.
BOOKS KINOKUNIYA
DAIMARU Department Store
STELLAR PLACE
JR TOWER
South Exit
Subway Sapporo Sta.
ESTA
TOKYU Department Store
Botanic Garden of Hokkaido University
Former Hokkaido Government Office Building
Sapporo Grand Hotel
Nishi 4, Kita 1, Chuo-ku
Phone: 011-261-3311
CITIBANK
SAPPORO GRAND HOTEL
Sapporo Chuo Police Station
Clock Tower
N
0
100
200
300
m

Floor Map

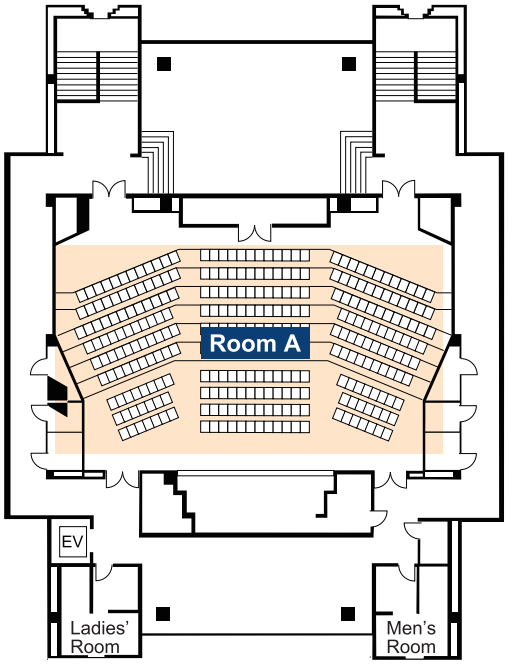
Hokkaido University
Conference Hall – 1F



Hokkaido University
Centennial Hall – 1F



Hokkaido University
Conference Hall – 2F



Organized by
Japanese Geotechnical Society

Under the auspices of
International Society for Soil Mechanics and Geotechnical Engineering