



TC 215 CPEG 2013 SYMPOSIUM

COUPLED PHENOMENA IN ENVIRONMENTAL GEOTECHNICS
from theoretical and experimental research to practical applications
Politecnico di Torino, Italy , 1st – 3rd July 2013

PRELIMINARY PROGRAMME

Monday, July 1st

- 08:00-09:00** Registration
09:00-09:45 Welcome and Opening Session
M. Gilli, Rector of the Politecnico di Torino
R. Frank, ISSMGE Board
S. Aversa, President of the Italian Geotechnical Society
D. Cazzuffi, President of the IGS Italian Chapter
M. Manassero, TC 215 Chair
09:45-10:45 **Keynote lecture**
Recent advances in understanding and improving the performance of lining and capping systems for landfill and mining applications
R.K. Rowe
10:45-11:05 Coffee break

Session 1. Landfill bottom and sides lining systems

Chair: E. Pasqualini

- 11:05-11:35** **General report**
Membrane behavior in engineered bentonite-based containment barriers:
State of the art
C. Shackelford
11:35-11:50 **Specific lecture**
Osmotic phenomena in bentonites
A. Dominijanni, M. Manassero & S. Puma
11:50-12:05 **Session report: N. Touze-Foltz**
12:05-12:55 **Oral presentations**
Polymer treatment of Ca-bentonites compared to the standard sodium activation method
G. Di Emidio, R.D. Verastegui F. & A. Bezuijen
Influence of membrane behavior on solute diffusion through GCLs
M. Malusis, J. Kang & C. Shackelford
Hydraulic behaviour of activated calcium bentonite mixed with polyionic charged polymers for landfill and earthwork applications
A. Razakamanantsoa, I. Djéran-Maigre & G. Barast
Interaction between clogging of a leachate drainage layer and leakage through a composite liner
R.K. Rowe, Y. Yu & M.S. Hosney
Some geotextiles properties useful for HDPE geomembrane puncture protection
G. Stoltz, D. Croissant & N. Touze-Foltz
12:55-13:10 **Discussion leader: M. Malusis**
13:10-14:15 Lunch

Session 2. Landfill waste characterization

Chair: W. Van Impe

- 14:15-14:45** **General report**
Liquid and gas flow in municipal solid waste
W. Powrie, R.P. Beaven, D.S. Holmes & A.P. Hudson
14:45-15:00 **Specific lecture**
Effect of mechanical settlement on biogas transfer in MSW landfills
L. Oxarango, J.P. Gourc, G. Stoltz & A.J. Tinetti
15:00-15:15 **Session report: S. Foti**
15:15-15:55 **Oral presentations**
Dynamic characterization of municipal solid waste by SDMT
F. Castelli & M. Maugeri
A laboratory landfill simulator for physical, geotechnical, chemical and microbial characterization of solid waste biodegradation processes
X. Fei, D. Zekkos & L. Raskin

2011 East Japan earthquake and tsunami – Geoenvironmental challenges
T. Katsumi, T. Inui, A. Takai, K. Endo, H. Sakanakura, T. Yasutaka, Y. Otsuka, H. Suzuki, H. Sakamoto, M. Okawara & H. Imanishi

Composition and degradation effects on the compaction characteristics of municipal solid wastes

H.F. Pulat & Y. Yukselen-Aksoy

15:55-16:10 Discussion leader: T. Katsumi

16:10-16:30 Coffee break

Session 3. Stability and settlement analysis of landfills and natural slopes

Chair: L. Cascini

16:30-17:00 General report

Experimental evidence of anisotropy in municipal solid waste

D. Zekkos

17:00-17:15 Specific lecture

Mass loss and volume change: from sand-salt analogues to MSW

J.R. McDougall, I.R. Fleming, R. Thiel, P. Dewaele, D. Parker & D. Kelly

17:15-17:30 Session report: G. Viggiani

17:30-18:20 Oral presentations

HydroMechanical coupled model for unsaturated phenomena in a rainfall-induced landslide

W. Arai, I. Djéran-Maigre, F. Prunier & A. Millard

A model for anaerobic degradation of municipal solid waste

Y.M. Chen, R.Y. Guo, Y.C. Li & L.T. Zhan

J-integral as a useful fracture parameter for analysis of desiccation cracking in clayey soils

S. Costa, J. Kodikara & J. Xue

Soil mass stability analysis using Euler-Lagrange coupling

M.S. Şerbulea, A. Andronic, D.M. Manoli & A. Priceputu

Piggyback liner detection by means of spatially constrained inversion of SWM data

S. Stocco, C. Castiglia & D. Mainero

18:20-18:35 Discussion leader: N. Dixon

Poster presentations

Poster attendance by authors during the last 30 minutes of the lunch break and during coffee breaks.

Poster session 1. Landfill bottom and sides lining systems

Dynamic shear behavior of geosynthetic-soil interface and numerical implementation considering chemical effect

C.W. Kwak, I.J. Park, J.B. Park & J.K. Kim

Poster session 2. Landfill waste characterization

Geotechnical characterization of waste dredged sediments for Algerian dams

M.A. Bourabah, B. Serbah, N. Abou-Bekr & S. Taibi

Correlation between compressibility and degradation for a PTMB waste

M. Conte, J.P. Gourc, P. Carrubba, L. Oxarango

Leachate recirculation using horizontal trenches considering the effect of MSW settlement

S.J. Feng & X. Zhang

Shear strength of municipal waste materials from two landfills in Serbia

D. Rakić, L. Čaki & S. Ćorić

Poster session 3. Stability and settlement analysis of landfills and natural slopes

Water retention and shrinkage properties of a cemented dredged material

A.C. F. Chiu, X.P. Hu, C.W.W. Ng & G.H. Lei

Three-dimensional rotational-translational mechanism for the stability analysis of landfill

H. Wang & M. Huang

Tuesday, July 2nd

- 09:00-10:00 Keynote lecture**
Coupled modeling of barriers for radioactive waste disposals
A. Gens
- 10:00-10:20 Coffee break**

Session 4. Linings for radioactive waste and capping systems for landfills and polluted sites

Chair: D. Cazzuffi

- 10:20-10:50 General report**
Capillary and monolithic capping
C. Benson
- 10:50-11:05 Specific lecture**
Modeling the coupled chemo-mechanical behavior of compacted active clays
G. Musso, G. Della Vecchia & E. Romero
- 11:05-11:20 Session report: H. Rahardjo**
- 11:20-12:20 Oral presentations**
Micropore vs. macropore flow: Implications for landfill final cover design
M.V. Khire & D.S. Saravanathiiban
Coupled thermo-hydraulic pulse tests on two reference Belgian clay formations. Laboratory experiments and numerical study
A. Lima, E. Romero, A. Gens, J. Vaunat & X.L. Li
Capillary barrier system for landfill capping
H. Rahardjo, A. Satyanaga, F.R. Harnas, J.Y. Wang & E.C. Leong
Geosynthetic clay liner gas permeability relationship with moisture content and suction under pre-conditioning stresses
M.A. Rouf, R.M. Singh, A. Bouazza & R.K. Rowe
Modeling of strain localization in radioactive waste disposal galleries
F. Salehnia, R. Charlier & S. Levasseur
Crack control of landfill liner and cap materials using nano-alumina powder
M.R. Taha & O.M. Taha
- 12:20-12:35 Discussion leader: C. Ng**
- 12:35-13:45 Lunch**

Session 5. Underground energy issues

Chair: G. Barla

- 13:45-14:15 General report**
Advances in the analysis of thermo-active foundations
L. Laloui, T. Mimouni & F. Dupray
- 14:15-14:30 Specific lecture**
Soil effective thermal conductivity from energy pile thermal tests
A. Bouazza, B. Wang, R.M. Singh
- 14:30-14:45 Session report: R. Katzenbach**
- 14:45-15:35 Oral presentations**
Coupled phenomena induced by freezing in a granular material
F. Casini, A. Gens, S. Olivella & G.M.B. Viggiani
Effect of groundwater flow on the THM behavior of an energy pile
F. Dupray, M. Baehler & L. Laloui
Thermal, hydraulic and mechanical performances of enhanced grouting materials for borehole heat exchanger
S. Erol & B. François
Long term performance of heat exchanger piles
C.G. Olgun, S.L. Abdelaziz & J.R. Martin
A device for studying simultaneous heat and moisture movement through soils
B.H. Rao
- 15:35-15:50 Discussion leader: F. Verga**
- 15:50-16:20 Coffee break**

Session 6. Natural and anthropogenic bio-chemical processes within soils and rocks

Chair: L.G. de Mello

- 16:20-16:50 General Report**
Bio-geo-chemical processes for improvement of soil engineering properties with focus on microbially induced calcite precipitation
J.D. DeJong, B.C. Martinez, T.R. Ginn & D.C. Nelson
- 16:50-17:05 Specific Lecture**
Modification of clay consolidation properties using microbial gas production
A.M. Puzrin
- 17:05-17:20 Session report: C. Jommi**
- 17:20-18:10 Oral presentations**
Mechanical and hydraulic effects of deep roots planting on slope stability
M. Cecconi, V. Pane, P. Napoli & C. Zarotti
Chemo-mechanical weathering of calcarenites: experiments & theory
M.O. Ciantia, C. di Prisco & R. Castellanza
Chemo-mechanical behaviour of a low activity clay
A. Ferrari, P. Witteveen & L. Laloui
Exploiting physico-chemical modification of soils in closed face tunnelling machines
S.A. Jefferis & A.S. Merritt
Combining biomineralization with chemically enhanced drainage in soils
P. Minder & A.M. Puzrin
- 18:10-18:25 Discussion leader: M. Manassero**

Poster presentations

Poster attendance by authors during the last 30 minutes of the lunch break and during coffee breaks.

Poster session 4. Linings for radioactive waste and capping systems for landfills and polluted sites

- Environmental restoration with deep roots herbaceous species
N. Era & T. Verrascina
- Improved correction factor for indirect determination of permeability function
Priono, H. Rahardjo, E.C. Leong, J.Y. Wang & K. Chatterjea
- Constitutive model for unsaturated soils based on the effective stress
H. Shin & S.R. Lee

Poster session 5. Underground energy issues

- Numerical study of the heating-cooling effects on the geotechnical behaviour of energy piles
A. Di Donna, F. Dupray & L. Laloui
- Technical and economic feasibility study of different thermal energy supply systems scenarios for multi-residential buildings
R. Katzenbach, F. Clauss, D. Casini & H. Früchtenicht
- Soil thermal behavior of a horizontal ground source heat system
H.R. Thomas, B.D.P. Hepburn & M. Sedighi

Wednesday, July 3rd

09:00-10:00 Keynote lecture

Application of solid potassium permanganate in a horizontal reactive permeable barrier against VOC vapours: Batch and column experiments

M.G. Mahmoodlu, S.M. Hassanizadeh, N. Hartog, A. Raoof

10:00-10:30 Coffee break

Session 7. Characterization of polluted sites and related aquifers

Chair: M.C. Zanetti

10:30-11:00 General report

Multiphase aspects of soil contamination by immiscible petroleum hydrocarbons

P. Delage

11:00- 11:15 Specific lecture

Injection of zero-valent iron micro- and nano-particles for groundwater remediation: laboratory tests and transport modelling

T. Tosco, F. Gastone & R. Sethi

11:15-11:30 Session report: D. Singh

11:30-12:20 Oral presentations

Characterization of LNAPL distribution in whole domains subject to precipitation by the simplified image analysis method

G. Flores, T. Katsumi, T. Inui & H. Ramli

Interaction of metal adsorption and solubilization in a compacted lateritic clay

S.G. Gabas & M.E.G. Boscov

Factors affecting heavy metal leaching from excavated rocks with natural contamination

T. Inui, T. Katsumi, A. Takai & M. Kamon

Development of batch equilibrium test methodology for estimative of the retardation factor (R_d) of hexachlorocyclohexane (HCH) isomers

L.S. Macedo, F.P. Manéo & G. Mondelli

A case study of contaminant transport and fate at a landfill site in China

M. Sedighi, H.R. Thomas, H.J. Xie, Y.M. Chen & C. Guan

12:20-12:35 Discussion leader: H.R. Thomas

12:35-13:45 Lunch

Session 8. Degradation, extraction and inerting systems for the reclamation of polluted sites

Chair: M. Petrangeli Papini

13:45-14:15 General report

Electrokinetic remediation of soils at complex contaminated sites: technology status, challenges, and opportunities

K.R. Reddy

14:15-14:30 Specific lecture

Modelling gas and water flow in environmental problems

S. Olivella

14:30-14:45 Session report: E. Romero

14:45-15:35 Oral presentations

The use of lime in the stabilization and solidification of lateritic soil contaminated with tannery effluent

A.O. Eberemu

Preliminary results on the stabilization of dredged sediments from the Port of Taranto

A. Federico, A. Murianni, E. Miccoli, C. Vitone, M. Nobile & G. Internò

Sustainable remediation of contaminated sites

C.N. Mulligan, S. Dumais & R. Noel-de-Tilly

Prediction of time to reduce tsunami sediment salinity by rainfall after the 2011 Great East Japan Earthquake

K. Tada, H. Komine & S. Murakami

Green and sustainable remediation of contaminated Indian Ridge Marsh site in Chicago, USA

E.N. Yargicoglu & K.R. Reddy

15:35-15:50 Discussion leader: H. Komine

15:50-16:20 Coffee break

Session 9. Active and passive barriers for polluted sites

Chair: Eduardo E. Alonso

16:20-16:50 General report

Cement bentonite cutoff walls for polluted sites

K. Soga, K. Joshi & J.C Evans

- 16:50-17:05** **Specific lecture**
 Migration of aggressive solutions through cement-bentonite slurry walls
E. Fratalocchi, V. Brianzoni, M. Di Sante, F. Mazzieri, E. Pasqualini
- 17:05-17:20** **Session report:** *N. Moraci*
- 17:20-18:00** **Oral presentations**
 Critical aspects related to Fe^0 and Fe^0 /pumice PRB design
S. Bilardi, P.S. Calabrò & N. Moraci
 Flow and transport numerical modeling as a method of efficiency assessment of vertical barriers on landfills
E. Koda, P. Osiński & T. Kołanka
 Design, installation and performance of containment system at a petroleum-release site
A. Sanzeni, M. Morando, E. Crescini & A. Guerini
 Hydraulic barrier performance of soil bentonite mixture cutoff wall
A. Takai, T. Inui, T. Katsumi, M. Kamon & S. Araki
- 18:00-18:20** **Discussion leader:** *M.E.G. Boscov*

Poster presentations

Poster attendance by authors during the last 30 minutes of the lunch break and during coffee breaks.

Poster session 7. Characterization of polluted sites and related aquifers

- Novel techniques for simulating and monitoring impact of contaminants on geoenvironment
K.R. Iyer, P. Pathak & D.N. Singh
- Studying the effects of contamination on the geotechnical properties of clayey soil
M.O. Karkush, A.T. Zaboon & H.M. Hussien
- The resistivity piezocone for high resolution geo-environmental site investigation: A Brazilian example
M.T. Riyis & H.L. Giacheti
- Effect of geometrical sand drains on consolidation of soft contaminated marine clays using Oedometer
M.V. Shah & A.V. Shroff
- Geostatistical analysis of groundwater nitrates distribution in the Plaine d'Alsace
R.-L. Spacagna, C. de Fouquet & G. Russo