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(WIP05) Workshop**

The WATMOVE team are organising a workshop in Madrid on October 27<sup>th</sup> 2005. See page 4 for more details

**Other news:**

**BCRA in Trondheim  
BCRA'05, Trondheim, Norway,  
27-29 June 2005**

**Dissertation**

*Water and Heat Transport in Road Structures*, Klas Hansson,  
<ftp://www.hyd.uu.se/Klas/>

**Find out more**

[www.watmove.org](http://www.watmove.org)

is a *portal* to the web sites of the COST Action 351 in Europe. Keep up-to-date about our Action by checking this site regularly. It's the first place that our reports will appear. *Register there to receive e-mail updates* on the WATMOVE project.

**Editor**

Åke Hermansson VTI  
[ake.hermansson@vti.se](mailto:ake.hermansson@vti.se)

*Why not let me have some information about water in road pavements and their earthworks? I'd be very happy to publish details of your case history or research study in Issue 2, due out this Autumn.*

## WELCOME TO WAT-MOVES





by **Chairman Andrew Dawson, University of Nottingham, UK**

Hello! Welcome to this first newsletter of the COST 351 Action on "Water Movements in Road Pavements and Embankments". COST is an acronym standing for "Co-Operation in Science and Technology" and is an organisation which helps engineers and scientists join together to pool national research studies, helping understanding to develop. COST 351 is one of the Transport projects (or "Actions" as they are called) and runs from Dec. 2003 to Dec.2006



*Excess water in this pavement is seeping out between the carriageway and shoulder. It's also the cause of premature pavement cracking*

Our main aim is to increase the knowledge required for improving highway performance and minimising the leaching of contaminants from roads and traffic. Improvements will lead to less road closures, better use of the road network, longer service life and more effective transportation of goods, services and people. Secondary objectives are:

-  to identify water movement and moisture conditions in unbound pavement layers and subgrades for different types of road constructions in various climatic conditions,
-  to investigate the relationship between the mechanical behaviour of materials/soils and their hydraulic conductivity and moisture condition,
-  to implement finite element modelling based on laboratory analysis and field studies in order to simulate water movement and moisture conditions in road construction,
-  to identify, investigate and control contaminants leaching from soils, natural aggregates and by-products.

We decided to publish this Newsletter about twice a year to let our friends and colleagues know about our work. We hope you find it informative and interesting. The hard-working editor of Wat-Moves, Åke Hermansson deserves a special "Thank you".

I'd especially like to invite you to WIP05 - A one day conference in Madrid, 27th October, 2005 on "Water in Pavements". Up-to-date details are on our website, [www.watmove.org](http://www.watmove.org), and some more information is given on page 4. If you have comments about our study or this Newsletter, please contact me. Best wishes,

**Mr. Andrew Dawson**

[andrew.dawson@nottingham.ac.uk](mailto:andrew.dawson@nottingham.ac.uk)

## Technical visit in Portugal

Mihael Brenčič Geological Survey of Slovenia

Following our management committee and working group meetings in Lisbon in November 2004, our host Jose Faisca from Instituto das Estradas de Portugal took us to a technical visit of the main road IP6 Peniche – Óbidos north of Lisbon. Early in the Saturday morning our first stop was in the small town of Óbidos where they had just started a chocolate festival. After the sweet beginning our next stop was at the headquarters of the new road construction site. Jose explained to us new construction plans and proposed solutions for the foundation of the embankment in the soft ground of alluvial deposits. After that we stopped on the marshes where problems of the construction of the new road with retention pond facilities were illustrated to us.

The next stop was at the already constructed part of the main road IP6 across the Atouguia artificial lake, which is a drinking water reservoir. We looked into the treatment basins of runoff waters drained from the road. They consist of big retention ponds with the discharge to the water reservoir. It was interesting to compare the modern interception and water quality improvement installations with the next section of the road, built a few years earlier, where pavement run-off water drains directly into the lake. *[Readers' comments on the need to retrospectively provide modern drainage procedures to old pavements are invited – Editor]*

Our final stop was on the beautiful Atlantic coast in the tourist resort of Peniche.



**Retention pond near Atouguia reservoir on the road IP6 Peniche – Óbidos**

Photo: Mihael Brenčič/Geological Survey of Slovenia

## Road run-off treatment in Portugal

### A case-study

Teresa Leitão National Civil Eng. Laboratory

The project "Evaluation and management of road runoff" was developed by National Laboratory for Civil Engineering (LNEC) to the Portuguese Water Institute, between 2001 and 2004 (cf. Leitão et al., 2005)\*.

The main objectives of the project were:

- 1) to predict and measure road runoff quality characteristics for three case-studies
- 2) to characterise road runoff effects in the quality of receiving media (soil and water) for each case-study
- 3) to define a concept of water sensitive zones to road pollution
- 4) to propose road runoff treatment systems and design criteria
- 5) to define superficial and groundwater monitoring programmes for road pollution studies

One of the three case-studies is located in Borba basin. Runoff water was characterized for 6 rain events; for each event samples were automatically collected (4 to 11) and stored. Based on the results obtained, the Mean Event Concentration and the Local Mean Concentration were characterized for each one of the three roads' treatment basins of runoff waters drained from the road.



**Borba basin, A6, Portugal**

Photo: Teresa Leitão/National Civil Eng. Laboratory

\*Leitão, T.E., Barbosa, A.E., Henriques, M.J., Ikävalko, V. and Menezes, T., 2005 – "Avaliação e Gestão Ambiental das Águas de Escorrência de Estradas". Final Report. Report 109/05 NAS/DHA, National Laboratory for Civil Engineering, Lisbon, March 2005, 243 pp.

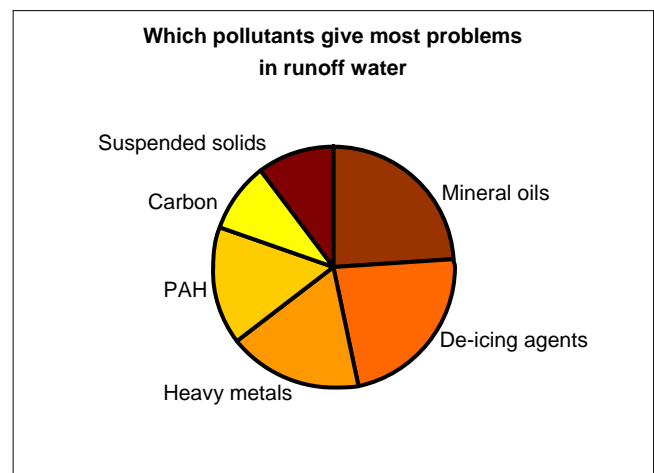
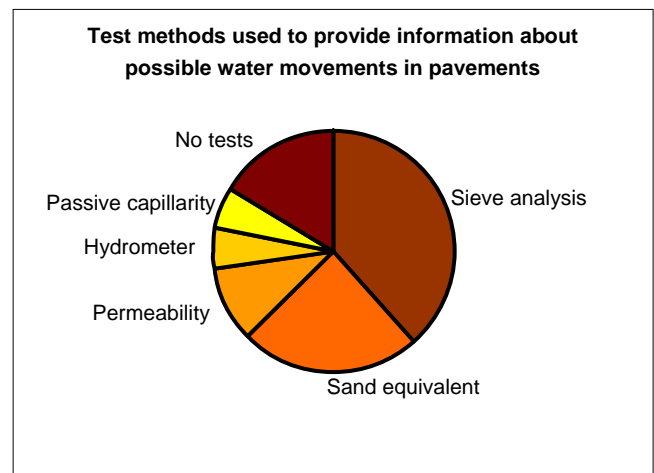
## Questionnaires will provide knowledge on state-of-practise

Susanne Baltzer, Danish Road Institute

The outcome of Cost-action 351 will be a book of current knowledge on "Water movements in Road Pavements and Embankments". To make sure that we have all relevant knowledge, also the knowledge regarding state-of-practise and practical experiences, we need input from professionals working with different aspects of water and moisture in pavements. In early spring 2005 we sent out a questionnaire to contact persons in most of the world. By now we are in the stage of receiving answers, which will contribute importantly to the book.

The questionnaire is divided into two parts. Part A concerns "Pavement drainage" and Part B concerns "Environmental aspects of water in road pavements and embankments". If you can provide answers to any one of these questionnaire parts, we would be grateful for your answer. You can find the questionnaires on the internet address: [www.watmove.org](http://www.watmove.org). Do not worry that the deadline for answers is passed. We will be happy to receive answers anyway. See figures for some preliminary result.

Contact: Susanne Baltzer – [sub@vd.dk](mailto:sub@vd.dk)



## Announcements

Course on Application of Finite Elements and Constitutive Models in Geotechnical Engineering, 16,17 & 18 June 2005, Lingotto campus of the Politecnico di Torino, <http://www.iacmag.org>

Bearing Capacity of Roads, Railways and Airfields, BCRA'05, Trondheim, Norway, 27-29 June 2005 <http://www.bcra05.no/>

10th International Conference on Urban Drainage - 10ICUD, Copenhagen, Denmark, 21-22 August 2005, <http://10icud.er.dtu.dk>

Treatment and Recycling of Materials for Transport Infrastructures (using lime, cement and hydraulic road binders), 24-26 October 2005, Paris, France, <http://www.tremti.org>

WIP'05 -Water in pavements – One-day Workshop, 27 October 2005, Madrid, Spain, <http://www.watmove.org/wip05>

4th Asia Pacific Conference on Transportation and Environment, 9-10 November 2005, Xi'an, China, <http://jtzx.net.cn/apte>

The Integrated Climatic Model (ICM) and the Enhanced version (EICM), "How well does it simulate drainage? Field validation". A Session at the 85th TRB Meeting, January 22-26, 2006, Washington, D.C

Active geotechnical design in infrastructure development, 29-31 May 2006, Ljubljana, Slovenia, <http://www.danube-conference2006.si>

Environmental and Technical Implications of Construction with Alternative Materials "WASCON 2006", 31 May - 2 June 2006, Belgrade, Serbia & Montenegro, <http://www.iscowa.org/wascon2006/>

Geoshanghai, 2-4 June 2006, Shanghai, China, <http://www.geoshanghai.org>

Advanced characterisation of pavement and soil engineering materials, 20-22 June 2007, Athens, Greece, <http://www.3dfem.org>

## Water in Pavements – WIP05

October 27th, 2005, Madrid, Spain

We warmly invite you to attend a one-day workshop in Madrid on all aspects of water in pavements.

### Official Language

English is the official language. Parallel translation (English-Spanish) will be available during the workshop.

### Publication

The papers will be assembled into a publication. Publication methods are being investigated at present.

**Preliminary program. Updates will be available at [www.watmove.org/wip05](http://www.watmove.org/wip05)**

### PERFORMANCE RELATED PROPERTIES OF THE PAVEMENT AND SUBGRADE MATERIAL

**Keynote 1-** Claudia Zapata *“Environmental effects in pavement design”*

- F Collin, Lyesse Laloui & Robert Charlier *“Chemistry, Suction and Temperature Mechanical Constitutive Unified Approach”*
- Pierre Hornych, Cyrille Chazallon, Absamad Elabd & Allou Fatima *“Prediction of permanent deformations of unbound granular materials, in relation with the moisture content”*

### MODELLING AND MONITORING PAVEMENT GROUNDWATER FLOW

**Keynote 2 -** Speaker to be confirmed *“Subsurface drainage systems: design & construction”*

- Delwyn Fredlund, Sandra Houston, & Claudia Zapata, *“Water observed beneath pavements”*
- Speaker to be confirmed *“Inspection and maintenance of subsurface systems”*
- Klas Hansson, *“Water flow in road structures”*
- P. Ampe, Jeroen De Corte & Griet Delepeleire *“Hydraulic aspects of block pavements: development of a hydraulic model for the water and particle movement in street layer course under pavements”*.
- Binh Vuong *“Measuring, predicting and specifying moisture in granular pavements with thin surface seals”*
- Andrew Dawson & Philip Boothroyd, *“Drainage in reality - a survey of practising engineers in the UK”*

### ENVIROMENTAL ASPECTS

**Keynote 3.1 -** Bert Allard *“Heavy metals in soils, mobility, pathways & distribution mechanisms”*

**Keynote 3.2 -** Michel Legret *“Contribution of fluxes within the pavement and embankment to the overall road environmental pollution”*

- Defne Apul, Kevin Gardner & Taylor Eighmy, *“Modeling hydrology and reactive transport in roads: the effect of cracks, the edge, and contaminant properties”*
- Gene Miller & Defne Apul *“Characterizing the source metals, in asphalt pavement storm-water run-off”*

**FINAL CONCLUSIONS:** Chairman of COST 351, Andrew Dawson

### Venue

The workshop will be held at CEDEX' facilities, downtown Madrid.

### Price

The workshop will cost €180 inclusive of refreshments, lunch and documentation.

### Scientific Committee

José Baena, CEDEX, Madrid, Spain.

Mihael Brenčič, Geological Survey of Slovenia, Ljubljana, Slovenia.

Lyesse Laloui, EPFL, Lausanne, Switzerland.

**Please register** your interest in attending the workshop by visiting our web-site at [www.watmove.org/wip05](http://www.watmove.org/wip05)

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Centro de Estudios y Experimentación de Obras Públicas (CEDEX), [www.cedex.es](http://www.cedex.es)



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