

EDITORIAL

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Concrete Pavements

The development of road construction techniques in support of sustainable development

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At the previous World Road Congress (PIARC) held in Durban in 2003, it was concluded that the "Road to development runs through the development of roads". Indeed roads are a driving force in economic and social development and occupy and will continue to occupy a position at the head of the list of potential transport modes. Just as in other areas the need for innovation and progress in roads is self evident!

André Jasienski

Construction, maintenance, performance (1st part)

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The road is a technical object which should tend towards ever improved performance. But it is also increasingly an object of use which must provide services.

Such special civil engineering structures as roads and streets must be integrated within an efficient transport "supply" framework characterised by its availability, regularity, comfort, safety, blending with surroundings, and the treatment of environmental disturbances.

It is significant to observe that the expectations of road contracting agencies today cover a very broad spectrum, as testified to by the recent survey conducted by the World Road Association (PIARC).

Jean-Pierre Christy



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Construction, maintenance, performance (2nd part)

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In view of the subjects tackled under theme III of 6th International Symposium on Concrete Roads, the 22 papers dealt with in this general report will be divided up into 4 sub-themes in order to enhance their comprehension and to extract their most relevant elements.

The 4 sub-themes concerned were as follows :

- performance, technology, characterisation of materials and structures,
- construction traditional approaches,
- maintenance renovation,
- construction original or specific approaches.

Raymond Debroux



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The PIARC guideline on *in situ* recycling of pavements with cement

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Recycling techniques to take profit of materials from existing pavements are being increasingly used, due to different technical, economical and ecological reasons. Therefore, the Technical Committee C7/B on Pavements of PIARC (World Road Association) has prepared three guidelines dealing respectively with:

- hot recycling in plant of bituminous mixtures,
- cold *in situ* recycling with emulsion or foamed bitumen,
- cold *in situ* recycling with cement.

This article presents the main features of the Guideline on cement recycling.

It covers the different aspects of evaluation of the existing pavement, mix design, thickness design, machinery, execution of the works, quality control and cost appraisal.

Carlos Jofre

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Skid resistant, noise-reducing concrete roads 32

Concrete motorways providing high performance and durable operation have been manufactured for many decades; nevertheless, continuous advancements are necessary to fulfill changing boundary conditions. Major challenges here are posed by increases in the volume of traffic as special requirements of traffic safety, environmental compatibility and economy. In order to develop concrete motorways achieving high skid resistance and low noise over extended periods of time, several research programs have been and are being implemented in the Federal Republic of Germany to investigate dense and porous concrete. Some of the findings obtained so far have already been integrated into the revised set of rules concerning the manufacture of concrete pavements. Special importance has been attached to an optimization of texture through the introduction in 2002 of skid resistance tests during acceptance procedures and at the end of guarantee periods.
Peter Sulten

**Surface platforms for public transport.
New perspectives: the case of cement concrete** 43

As a result of Urban Travel Plans implemented in major cities, public transport is being favoured as a convenient means of travel and mobility by all. Platforms (road- and trackbeds) designed for public transport must offer quality from the technical standpoint in order to handle channelled loads or the insertion of rails, as well as from the aesthetic viewpoint, and we are witnessing increasingly accentuated policies aimed at environmental integration of transport infrastructures around main municipal sites. The specific problems of bus lanes, pneumatic-tired tramways and rail tramways are identified. Also looked into are the new and innovative designs involving cement concrete and corresponding to possible answers without any limitation on or exclusive use of this material.
Jean-Pierre Christory, Jean-Marc Cluzaud, Jacques Malod-Panisset, Jean-René Oury



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Example of internally vibrated concrete platform for pneumatic-tired tramway

Benefit of reduced fuel consumption from economic and environmental perspectives – A novel approach 50

Road traffic now represents one of the major sources of environmentally and hygienically harmful emissions. A reduction of the total quantity of traffic-related emissions would therefore yield great environmental benefits. A number of independent studies have demonstrated that the properties of the road, such as surface texture and rigidity, affect the fuel consumption of vehicles. The economic and environmental benefits of vehicles travelling on roads that have fuel consumption reducing properties are calculated in this study. A model has been developed for quantifying the benefits from the national economy aspect, and life cycle analysis (LCA) is used for calculating the reduced environmental impact. The results demonstrate that a seemingly small reduction in the fuel consumption of the vehicle leads to major national economy and environmental benefits.
Robert Larsson, Ronny Andersson

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Placing of slabs on the test-section

**The “High-Performance Concrete Carpet”
A new type of concrete course layer** 61

The article gives an overview on an on-going R&D project carried out by *Laboratoire central des Ponts et chaussées* (France). The aim is to develop a purely hydraulic road structure in accordance with modern infrastructure requirements, which may also be used to rehabilitate old rigid pavement. The High-Performance Concrete (HPC) carpet consists in building a thin, reinforced and unbonded HPC course layer over an hydraulic subbase. The concept is presented in details, and various questions are addressed, among which feasibility, texture, cracking, risk of buckling, resistance to traffic-induced degradation and economy. At this stage of development, where most laboratory research has been carried out successfully, the concept looks attractive and fits well with the present trend of sustainable development. A further validation is now necessary, through experimental test sections of sufficient size.
François de Larrard

Modieslab, Innovative Prefabricated Modular Concrete Slab for Concrete Roads and Airfields 65

The Dutch Federal Highway Administration introduced the project “Roads to the Future” in the year 2000. Amongst other innovations, the Modular Road, was one of the sub-projects. In a contest several parties in the roadbuilding business were asked to develop an idea for a modular type of road that had to fulfill the following demands: silent, fast to construct and reconstruct, high driving comfort, low maintenance costs, safe under all weather conditions. In this contest, a joint venture of three companies, Betonson, Heijmans and Arcadis, introduced the Modieslab-concept. The name Modieslab stands for Modular, Intelligent, Energetic and Slab.
Ferry Smits