

FOREWORD

Creep, shrinkage and durability of concrete and concrete structures have been the focus of a longstanding tradition conferences that can be traced back to almost fifty years ago. The first three conferences on concrete creep took place in Munich (1958, 1968) organised by H. Ruesch, and by H. Ruesch and F.H. Wittmann, and in Leeds (1978) organised by A.M. Neville. The fourth conference was held in Evanston (1986), organised by Z.P. Bažant. In 1993, Concreep 5 was held in Barcelona, organised by I. Carol and Z.P. Bažant and the acronym *Concreep* was coined at that time for this series of events. The last one, Concreep 6 was organised in Cambridge (USA) by F.J. Ulm in 2001. Each conference has been organised under the auspices of RILEM, with the sponsorship of national institutions and partners from industry.

In recent years, ensuring the scientific character of *Concreep* conferences has become more important than in the past because the level of treatment of the scientific issues addressed is becoming more sophisticated, more refined, and more specialised, and thus less accessible to non-specialists. Forty years ago, many good engineers not specialised in creep could conceive a sensible plan for a research conference on this subject, but not today.

Given this problematic situation, there was a need to define the character of future conferences on Concrete Creep, Shrinkage and Durability Mechanics to ensure that *Concreep* conferences would continue to serve as a forum of scientific exchange of new ideas at the highest level at the crossroad of solid mechanics, materials science, experimental mechanics, computational mechanics of concrete-like materials and structural engineering.

In 2001, during Concreep 6, it was decided to create a new international association *IA-Concreep* with the goal of establishing a durable umbrella organisation dedicated exclusively to this subject and serving as a permanent sponsor under which the conference series should develop with close relationships with other international organisations.

The main objective for which the association was constituted is to foster and promote within the scientific and engineering community a better understanding of the mechanisms, modelling and prediction of creep, shrinkage and durability of concrete, cement-based materials and other quasi-brittle materials. For this purpose, *IA-Concreep* arranges at regular intervals, typically three years, international conferences addressing the latest results and implementation strategies of creep, shrinkage and durability mechanics research and the related structural engineering problems.

Concreep 7 is the first conference of the series to be held under the auspices of the international association *IA-Concreep* incorporated in Illinois (USA) in 2001. Four years ago, at the time of the founding general assembly of *IA-Concreep*, it was decided that the conference would be hosted by the R&Do group at the Institut de Recherche en Génie Civil et Mécanique (GeM) of Ecole Centrale de Nantes, Université de Nantes and CNRS. Bruno Gérard from Oxand SA and Paul Acker from Lafarge joined the team, along with the main sponsor of this group, Electricité de France who took over the organisation of an invited industrial session.

After the call for papers, more than 120 papers have been submitted. The organisers wish to express their gratitude to the members of the scientific committee for their prompt and careful reviewing of the abstracts and to the local committee for a strong involvement in the practical organisation of this event.

The conference proceedings gather 93 keynote, invited and contributed lectures divided into 9 categories:

- Creep mechanisms and creep – fracture interaction
- Modelling of creep and shrinkage
- Multiphase and multiscale approaches to shrinkage
- Durability
- Creep and shrinkage in structures
- Early age creep and shrinkage: Experiments and modelling
- Temperature effects
- Self compacting concrete
- High performance concrete

We hope that the proceedings of Concreep 7 will serve as a major reference, in accordance with the longstanding tradition of *Concreep* conferences directed both toward cutting edge scientific results and innovative engineering practice.

Finally, we would like to acknowledge the numerous sponsors of this event: the ministry of research, the national research and technology network on civil and urban engineering, the national center for scientific research, la Région des Pays de la Loire, Nantes Métropole, the partners of the R&Do group: Lafarge, Oxand SA and Electricité de France, and last but not least, our host institution: *Centrale Nantes*.

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