DBV-Heft Nr. 4

# Beton und Umwelt

## Concrete and Environment



Beiträge des fib-Symposiums
„Concrete and Environment“
3. bis 5. Oktober 2001 in Berlin

Deutscher Beton- und Bautechnik-Verein E.V.

# Proceedings

*fib*-Symposium

# Concrete and Environment

Berlin, Germany

**3-5 October 2001**

edited by

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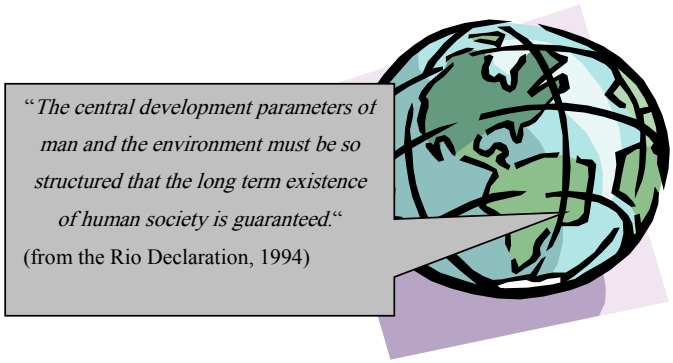
*fib*-Symposium

# *Concrete and Environment*

Berlin, Germany
3-5 October 2001

Haus der Kulturen der Welt
(House of World Cultures)
John-Foster-Dulles-Allee 10
10557 Berlin
Germany

organized by:
***German Group of fib***
DBV - Deutscher Beton- und Bautechnik-Verein E.V.
DAfStb - Deutscher Ausschuss für Stahlbeton im DIN Deutsches Institut für Normung e.V.



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## *Foreword – President´s Message*

"Concrete and the environment" is on its way to become one of the major topics in practical design and construction. During the last decade's research on concrete and concrete structures has mainly focused on aspects like safety and serviceability. The consciousness of the significance of durability and sustainability is still relatively young. However, it is now already a common feeling that those aspects must play a crucial role in the near future. This new way of thinking will have important consequences for the direction in which design strategies will develop. The same holds true for the process of execution and the developments of contractual regulations, code requirements and research.

*fib* is an international organization with National Groups in 39 countries and members or participants in its work from about 60 countries. Its main goal is to stimulate and coordinate future-oriented research and to give direction to the development of new building codes. In the past CEB and FIP, the organizations, which preceded *fib*, published "Model Codes" for Structural Concrete in 1963, 1978 and 1990. Those Model Codes were intended to be a source of information for the development of national and international codes. The Model Code 1990 has been an important basis for the new Eurocode, which is bound to be the code used throughout Europe, as such stimulating and strengthening the international cooperation.

The interest of CEB and FIP in durability in the past was mainly directed to durability in the sense of expected lifetime. The way in which deterioration processes endanger the life of a structure was well described in CEB Bulletin 183 "Durable Concrete Structures". This Bulletin was the onset to the development of the new approach "Design for Durability". The conceptual work leading to this new approach was mainly done within the scope of the European research program "Duracrete". The design strategy developed enables predicting the forthcoming need for repair, to select the most appropriate maintenance strategy and to allow cost optimization calculations for concrete structures with due regard to their lifetime. It furthermore gives impetus to the introduction of defined performance concrete's, taylor-made for the governing environmental conditions. *fib* is now starting its work for a new Model Code for Concrete Structures. Design for durability will be a major point of attention. Studies in this area are now performed in *fib*-Commission 5 under the chairmanship of Dr. Steen Rostam from Denmark.

However, in spite of its significance, "durability" as a thematic indication is still too narrow. In order to save our environment from unnecessary burdens now and in the future and to improve the quality of life, suitable strategies have to be developed. This covers a wide area, from the development of clean production methods to the generation of structural systems, which can be adapted to changing demands in time, methods for the optimum use of resources, and new concepts for concrete structures protecting the environment. Such subjects are studied in *fib*-Commission 3, under the chairmanship of Prof. Peter Schiessl from Germany. These relatively new areas are of utmost importance for a responsible use of concrete in the near future.

In the area of durability and sustainability considerable work is still necessary in order to develop new ideas and methods, and establish regulations. Therefore this symposium has been organized exactly at the right time. The papers in the proceedings cover various areas of importance, give a good idea of the state of the art and show perspectives to new ideas and developments. We are indebted to our German colleagues for their initiative to organize this symposium and the efforts they have done to make it a major event. We sincerely hope that this symposium will be a milestone in a very important new process of development.

Joost Walraven

President of fib

## *Foreword – Organizing Committee of the fib-Symposium*

Environmental aspects or, in other words, sustainable development have become a major concern of our time. The general principle of sustainable development has been first formulated by the Brundtland Commission in 1987. Due to the adoption of the Agenda 21 in Rio de Janeiro by 179 Nations in June 1992, the course for sustainable development was set. As a result of that a gradual change in the fundamental social and economic values will take place. Sustainable development means the satisfaction of the present-day needs without risking that future generations will not have the chance to satisfy their needs.

National legislation has taken place in several countries following these principles, thereby strongly influencing technical rules. This development will have a major impact on all activities related to design and construction in the future.

Therefore, the fib-Symposium "Concrete and Environment" will deal with these aspects and highlight the following main subjects:

- Impact of concrete structures on man and environment,
- influence of environment on the service life of concrete structures,
- ability of concrete structures to protect man and environment against hazards.

The symposium with its highly relevant programme will offer an international forum for engineers active in practice or research, politicians, architects, consultants and contractors.

Peter Schiessl Hans-Ulrich Litzner

Lars Meyer Udo Wiens

Organizing Committee of the fib-Symposium