

Sustainable Construction with Concrete
– Consolidating the Phases of Life Cycle in a Holistic Approach –

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Extended Abstract

Although a growing number of requirements for sustainable building are being laid down, there are still many uncertainties and different views on the benchmarks for evaluation and on how to implement sustainable building in practice. The principles for considering aspects of sustainability in the design, execution, use and deconstruction of concrete structures will be established in the joint research project with the aim of promoting sustainable building with concrete and establishing it firmly in practice. With this aim in mind,

- aspects of sustainability must be integrated into existing principles for design and execution,
- existing evaluation methods, as well as those under development, must be tailored to the needs and boundary conditions of concrete construction,
- proposals for technical solutions that will contribute to sustainable development, in particular at the interfaces of individual phases of the life cycle of structures, will be made available to the parties involved in construction, taking their responsibilities into account,
- planning tools and new information and communication tools tailored to the needs of the various actors will be developed to ensure the transfer of the relevant information throughout the life cycle of a structure.

Plans for the joint research project were drawn up on the basis of the state of the art report "Sustainable Construction with Concrete" [1]. The current knowledge on the contribution of construction with concrete to sustainable development has been summarized therein and open questions have been compiled. These questions have been structured within the application for funding which was submitted to the Federal Ministry of Education and Research (BMBF) under the "Research for Sustainability" initiative (www.fona.de). The first phase of the project ran from Mai 2005 until October 2006 and provided already important components for methodological and technical solutions [2]. The second phase of the project started in November 2006 and will be terminated at the end of October 2009. The German Committee for Structural Concrete (DAfStb) is coordinating the research work. The main aim of the project as a whole is to draw up a guideline stating the principles for sustainable building with concrete considering the developments on the ISO- and CEN-level (CEN/TC 350 and ISO/TC 59/SC 17). The guideline will provide extensive support for the main parties involved in concrete construction and will be geared to sustainable building in practice. It is comparable to the principles for specifying safety requirements for structures stated in EN 1990, which created the theoretical basis for such requirements in all design standards by defining the probabilities of failure based on a probabilistic approach and partial factors. In addition to this, the paper will set out guidelines for sustainable building with concrete, which are intended to be incorporated directly in future standards and directives, both national and international, on concrete construction. The implementation of the guidelines in standards and in practice is ensured by concentrating the interests of the industry as a whole (structural designers, producers of construction materials, the construction industry, authorities, private and public clients) in the DAfStb and owing to the close links between that committee and the German Institute for Standardization.

The presentation will focus on exemplary results of the joint research project:

- specification of methods of evaluation sustainability,
- utilisation of secondary materials,
- optimisation of design principles and how to increase energy efficiency,
- establishment of the main components of life cycle management systems,
- draft content of the guideline.

References

- [1] Reinhardt, H.-W. (et al.): Sachstandbericht „Nachhaltig Bauen mit Beton“. – Berlin: Beuth. In: Schriftenreihe des Deutschen Ausschusses für Stahlbeton (2001), Nr. 521 – ISBN 3-410-65721-5
- [2] Schlussberichte zur ersten Phase des DAfStb/BMBF-Verbundforschungsvorhabens „Nachhaltig Bauen mit Beton“. – Berlin: Beuth. In: Schriftenreihe des Deutschen Ausschusses für Stahlbeton (2007), Nr. 572