1 Scope

2

The *fib* Model Code for Concrete Structures 2010 was an initiative taken by *fib*'s predecessors CEB (Comité Euro-International du Béton) and FIP (Fédération Internationale de la Précontrainte) at a time when there were hardly any international codes. Since, in those days, CEB and FIP were both organisations aiming to synthesize international research and experience, it was regarded as an important step forward to convert this knowledge and experience into practical documents for design, so that national code commissions could take advantage of it. The first code-like recommendations in 1964 and 1970 were used in this way. The Model Code 1978 also contributed to international harmonization. The Model Code 1990 provided confirmation of that intention, by serving as an important basis for the most recent version of Eurocode 2.

The main intention of the *fib* Model Code 2010 is to contribute to the development of improved design methods and the application of improved structural materials. Therefore adequate attention is given to innovative materials such as high-strength concrete, steel fibre concrete and non-metallic reinforcement. Constitutive relations are given for concrete up to strength classes of C120 for normal density concrete and LC80 for lightweight concrete. Moreover design rules are given for fibre reinforced concrete, which apply as well to higher strength classes. An important new aspect is the life cycle concept, which serves as a basis for a holistic design approach. Structures have to be designed for structural safety and serviceability for a specified period. This includes design for durability and sustainability. In order to design a structure with a low need for substantial maintenance during its service life, measures have to be taken in the design stage to ensure this and to carry out control when the structure is in service.

Explanations are given on the left-hand side. In this respect, reference is often made to the sources that were used to derive the design recommendations. These sources can be *fib* Bulletins, CEB-FIP Bulletins, and other codes (ISO) or papers in scientific journals.

Level I is reserved for structures where high accuracy is not required. It can also be used for pre-design of structures in a more general sense. Higher level methods can be used in cases where higher accuracy is required. An example of this is the assessment of an existing structure for its bearing capacity, supporting the decision of whether repair is necessary or not.

1.1 Aim of the *fib* Model Code 2010

The *fib* Model Code for Concrete Structures 2010 is intended to serve as the basis for future codes for concrete structures. Whereas existing operational codes are legal documents, based on mature knowledge, the *fib* Model Code also takes into account new developments with respect to concrete structures, the structural material concrete, and new ideas with respect to requirements to be formulated, so that structures achieve optimum behaviour according to new insights and ideas. In this Model Code, those new ideas refer not only to traditional demands with regard to safety and serviceability, but also take into account the increasing significance of design criteria for durability and sustainability.

For those who will be involved in updating existing codes or developing new codes for concrete structures, the *fib* Model Code should be a source of information. Whereas a normal operational code predominantly gives sets of application rules that should be transparent enough to be applied by professional designers while also accurate enough to be economical, the *fib* Model Code also aims to give sufficient background information.

Nevertheless the *fib* Model Code is meant also to be an operational document for everyday design situations and structures.

1.2 Format

The format of this *fib* Model Code follows the earlier CEB-FIP tradition:

- the main provisions are presented on the right-hand side in a logical sequence of topics. Structural requirements are stated, followed by the relevant design criteria, appropriate engineering models and/or design rules: their application is intended to satisfy the relevant structural requirements;
- explanations are given on the left-hand side, with specific diagrams, alternative simplified rules, short justifications of the options found on the right-hand side and references to other sources.

1.3 Levels of approximation

Various levels of approximation are possible for the design and assessment of concrete structures. Therefore in a number of chapters methods are offered with different levels of accuracy. Level I methods generally represent the most simple and straightforward approach, valid for standard cases. Higher levels are presented, which generally require more effort but may lead to more economic solutions.

1.4 Structure of the *fib* Model Code 2010

Part I, Principles: in chapters 2–4 subjects such as terminology, performance requirements and basis of life cycle management are addressed. Design strategies and design methods are subsequently presented.

Part II, Design input data: in chapters 5–6 the properties of the structural materials concrete, reinforcing and prestressing steel are given. Moreover, characteristics are given for interfaces between steel and concrete, and between concrete of different ages.

Part III, Design: in chapter 7 various design methods are addressed in 13 subchapters. A wide range of loads and environmental conditions are considered.

Part IV, Construction: in chapter 8 execution rules are given for concrete, steel and formwork.

Part V, Conservation and dismantlement: chapter 9 deals with conservation strategies, condition survey and assessment, interventions and recording. Finally, chapter 10 completes the life cycle discussion with information about dismantlement.

The *fib* Model Code 2010 is subdivided into five parts. The sequence of the parts reflects the basis of life cycle thinking:

- Part I: Principles
- Part II: Design input data
- Part III: Design
- Part IV: Construction
- Part V: Conservation and dismantlement