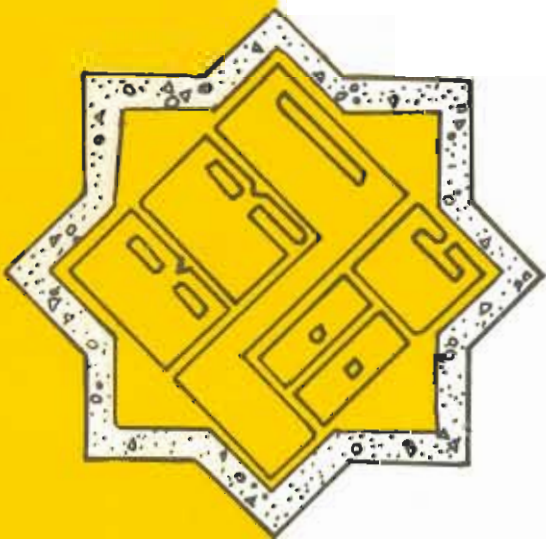


REPUBLIC OF IRAQ

CODE 1/1987

IRAQI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE



BUILDING RESEARCH CENTRE
SCIENTIFIC RESEARCH COUNCIL

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FOR REINFORCED CONCRETE
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“ IN THE NAME OF ALLAH, THE COMPASSIONATE, THE MERCIFUL ”

PREFACE

Iraq has witnessed, during the last two decades, a giant leap in number and volume of the implementation in the construction projects, which are an essential and integral part of the ambitious development plan of the country. Concrete structures represent a large proportion of these projects.

The absence of a national code for the design and implementation of these constructions, created a state of unhomogeneous application of various international codes on structures, which are built from unified local building materials and also subjected to unified environment. The absence of such code disturbed the process of implementation at the stages of design, checking and contracting. This consequently caused a great deal of waste at all levels and increased the cost of implementation of the projects. For all these reasons, the Building Research Centre (BRC), proceeded since 1978, with the project of the Iraqi Building Code Requirements for Reinforced Concrete. At the beginning a draft of the code was developed, which was considered as the first step to subject construction projects using reinforced concrete to unified rules and standards. This will at the end provide two main elements, mainly safety and the suitability of the construction to local environment. All this will surely enhance the economy of the country through the proper use of building materials. The Iraqi code project was one of the most important projects for the five year plan (1981-1985) of the centre, where a great deal of effort was put in to implement to this essential project.

A number of structural engineering researchers who belong to the staff of the centre developed the draft of the code. During the development the researchers referred to local and regional research work and investigations in this field. They also referred to the relevant international codes. The task was completed in November 1982.

A specialized code seminar was held in the centre for the period 25-27th April 1983, to discuss the proposed draft code in order to enrich this draft with the local and international experiences. This seminar was attended by Iraqi experts, making up the backbone of Iraqi experience in the field of structural engineering. In addition specialists from Arab and foreign countries were also invited to attend the seminar.

In order to implement the resolution of the seminar which adopted the draft with the view to its modification according to the discussion, the centre established a higher committee for the Iraqi building code requirements for reinforced concrete from specialists with a high level of expertism so they can work collectively to produce the final draft for the first national code for the design of reinforced concrete buildings, which satisfy the requirements of design, implementation and contracting. This code can also be referred to in the teaching process of the Iraqi engineering colleges.

The higher committee for the Iraqi code which was established in the centre consisted of twelve members with the relevant specialization and expertism and they are employed in the various building and construction establishments in the country. The reason for this choice is the nature of work which requires a varied experience and specialization which is invariably unavailable in a single institute. The members represent the following institutions:

Ministry of Housing and Construction, Ministry of Industry and Minerals, Ministry of Higher Education and Scientific Research (represented by the Universities of the country, Baghdad University, Mosul University and University of Technology), National Private Consulting Bureau, the Central Organization for Standardization and Quality Control and Iraqi Engineering Society in addition to researchers from the centre (Structural Department and Building Materials Department). The Committee started its work January 1984 and according to careful planned time schedule.

The committee adopted scientific foundations and concepts suitable with the scientific and technical development to produce the code. This was done so as to give the code sufficient flexibility to absorb any future development keeping in mind the suitability of the technical and scientific level of the code to the local environment.

I believe that issuing any code, is a dynamic process requires the updating of its various items from time to time so as to absorb all the new developed technologies and the output of the future scientific research work. On this basic the Iraqi code like any other international code requires updating as necessary every decade. The centre will perform this task.

At the time I present this code which will be issued in both Arabic and English for use by the construction sector in the country, I hope that it will participate in the support of our national economy and to enforce the idea of depending on our national experts to build our great country and the Arab homeland.

Finally, I would like to express my deepest thanks to the President of the Scientific Research Council for his continuous support. Thanks and gratitude are also due to all those who participated in accomplishing this important project, especially the members of the Iraqi code committee and the assisting staff.

Dr. Mohammed A.S. Elizzi
Senior Researcher
Director General of B.R.C.

FOREWORD

The committee of the Iraqi code for reinforced concrete was formed by the Building Research Centre (BRC). It comprises twelve experts in the fields of building construction, industry and higher education. The Central Organisation for Standardization and Quality Control and Iraqi Society for Engineers were also represented in the committee.

The committee commenced its work in January 1984 according to a set time schedule. The execution of work was done by dividing the committee into several specialized subcommittees. Each subcommittee was given a part of the draft code to study and revise and then prepare a proposal to be submitted for approval before it becomes as part of the first national code of practice for reinforced concrete.

The committee discussed the essence of scientific bases and knowledge in line with the scientific and technical developments in order to adopt them in the code and to give it enough flexibility to comprehend any future development without affecting its suitability for the local environmental conditions and technical levels.

On this basis the following items were adopted:

- 1- Adopting the draft code accomplished at the BRC as a basis, developing it according to the discussions carried out during the Iraqi code seminar in addition to the latest national and international scientific developments.
- 2- Confirming that the subject of the code is to be reinforced concrete for buildings as distinct from other subjects such as prestressed concrete or water retaining structures which have special additional requirements which require special publications as done internationally.
- 3- Adopting one set of regulations and method of analysis and permitting the use of other methods that have to be proven adequate.
- 4- Adopting the concept of limit states which guarantee limits of safety and serviceability of the structure during all loading stages. These limit states consist of three limit states, the ultimate limit state under the effect of factored loads and both cracking and deflection limit states under service loads. The adoption of the concept of limit states in the design provide the flexibility in choosing the required safety factors which guarantee acceptable safety limits of all parts of the structure and thus a global safety factor concerning the adequate performance of the structure as a whole.
- 5- Adopting the partial safety factor given in the CEB-FIP model code for concrete and reinforcing steel and design loads. The use of different partial safety factors for materials and loads instead of one global safety factor makes possible the ability to study the effects of design loads and materials on a structure separately thus achieving balanced designs which ensure the structure not reaching the ultimate limit state within reasonable degrees of probability in addition to ensuring enough flexibility in the code to accept future developments regarding loads and performance of materials.
- 6- Adopting the stress strain curve for both concrete and reinforcing steel as given in the BS 8110-1985.
- 7- The necessity of issuing the final form of the code in both Arabic and English languages at the same time to ensure the safe use of the code and preventing any possible misuse due to individual translation and interpretation of the various sectors in the code.
- 8- Adopting the results of local researches and studies carried out in the field of reinforced concrete especially hot weather concreting and loading tests of buildings.
- 9- The necessity of issuing design aids which contain design tables and charts that help the designer and ensure that designs are carried out according to the Iraqi code.

The Iraqi code consists of eighteen chapters comprising specifications and methods of testing materials and construction requirements. Several appendixes were added which list various standards and these include the Iraqi standards or internationally acceptable standards in case of absence of an Iraqi standards.

The process of issuing any code is a dynamic one which requires continuous updating of its various sections in order to comply with the technological developments of future research works and studies. Therefore, the Iraqi code, like other codes, require development when necessary. Based on international experience in this field the Iraqi code will need to be reviewed during a period of 5 to 10 years which is the usual time period used in reviewing and developing the various international codes.

The Iraqi code committee believes that the use of this first national code in the design and construction should be optional for a period of two years after issuing, at the end of which the code will be enforced and considered as an official national document for the design and construction of reinforced concrete structures and in the field of engineering teaching in Iraq.

Code Committee

