

(PREVIEW)

HANDBOOK ON STRUCTURES WITH REINFORCED CONCRETE PORTAL FRAMES (WITHOUT CRANES)

FOREWORD

The Department of Science and Technology set up an Expert Group on Housing and Construction Technology in 1972. This Group carried out in depth studies in various areas of civil engineering and construction practices followed in the country. During the preparation of the Fifth Five-Year Plan in 1975, the Group was assigned the task of producing a Science and Technology Plan for research, development and extension work in the sector of housing and construction technology. As a result of this and on the recommendation of the Department of Science and Technology, the Planning Commission approved the following two projects which were assigned to the Bureau of Indian Standards (BIS):

- a) *Project B-7* — Development Programme on Code Implementation for Building and Civil Engineering Construction; and
- b) *Project B-8* — Typification of Industrial Structures.

BIS has set up a special committee (SCIP) consisting of experts to advise and monitor the execution of these projects. A Working Group for Project B-8 oversees the work of the project.

In a developing country like India, the capital outlay under each Five-Year Plan towards setting up of industries and consequently construction of industrial buildings is very high. It is, therefore, necessary that the various parameters of industrial buildings be standardized on broad norms so that it will be feasible to easily adopt prefabricated members, particularly where repetitive structures could be used.

The standardization of parameters for industries by itself will be, no doubt, a difficult task as it will not be possible to specify the requirements of each industry. The layout including height will vary from industry to industry, for it depends on the process of manufacture and end products. However, a little more detailed analysis of the requirements indicates that the problem may not be as difficult as it appears. Although it would not be possible to specify any constraint on the parameters, a broad norm can be given within which most industries could be accommodated.

The object of the project B-8 is to typify at national level the common forms of industrial structures used in light engineering industries, warehouses, workshops and storage sheds, and to obtain economical designs under these conditions. Even if an industrial complex is classified as heavy industry, it need not necessarily mean that all the industrial structures coming within the complex should be heavy industrial structures and that many structures could be from the typified design.

The project on typification of industrial structures involved the following three main tasks prior to preparation of typified designs:

- a) **Task I** — Survey and classification of industrial structures into different types;
- b) **Task II** — Identification of industrial structures repeated a large number of times in the country, which are amenable for typification from the classified list prepared during task I; and
- c) **Task III** — Specifying the elements of the industrial structures to be typified taking into consideration a number of parameters, such as structures with cranes and without cranes, span length, height, support conditions, slope of roof, wind and earthquake forces, spacing, field and shop connections, material (steel, reinforced concrete), etc.

The data regarding physical parameters like span, spacing, roof slope, column height, crane loading, etc, of existing structures has been obtained from several public sector enterprises through Bureau of Public Enterprises (BPE). Some information from private industries has also been collected by BIS.