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Building

Research

Institute



COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, NEW DELHI

**Central
Building Research Institute**

R O O R K E E



COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, NEW DELHI



Central Building Research Institute, Roorkee

BRIEF HISTORY

THE development of science and technology, and of industries based on them, has created new and complex demands in the field of building construction. Diverse types of constructions are required for the functional efficiency, comfort and recreation of man and for industry and commerce. It has been realised in recent years that planned scientific research is essential for the effective solution of the many problems of building construction and specialised institutes have been established in several countries to provide facilities for building research.

Realising the need for systematic research in the field of building construction, the Council of Scientific and Industrial Research set up, in December 1943, a Buildings Research Committee, with the late Sir Teja Singh Malik as chairman, to help the organization of building research in India. At the first meeting of the Committee held in December 1944, two proposals came up for consideration. One was the setting up of a Division of Buildings and Housing as a part of the National Physical Laboratory of India. The second was the establishment of a Buildings and Roads Research Institute as suggested by the Industrial Research Planning Committee. Both proposals were considered inadequate. The number of problems connected with building research was large and a systematic scientific approach was essential for solving them. At the instance of Dr. S. S. Bhatnagar the Committee considered a proposal for the setting up of a national laboratory for building research and decided to recommend to the Council the establishment of a Central Building Research Institute. As

an immediate step the Committee proposed to set up a Building Research Unit at Roorkee to work in co-operation with the Thomason College of Engineering (now the Technical University of Roorkee). Dr. S. Parthasarathy was appointed officer in charge of the Unit and a nucleus staff was appointed in 1947. The Unit consisted of two sections; one of them, under Dr. N. K. Patwardhan, started research immediately—within the limited facilities available at that time—on short-term problems; the other section, under Mr. Dinesh Mohan, dealt with the planning of the Institute and the purchasing of equipment. In 1950, the Unit was transformed into the Central Building Research Institute with Dr. J. N. Mukherjee as Director. The foundation-stone of the new buildings was laid in 1951 by the Hon'ble Shri Sri Prakasa, the then Minister for Natural Resources and Scientific Research. The actual construction was taken in hand in December 1951. Dr. K. Billig was appointed Director of the Institute in 1952. Construction of the first part was completed with the opening ceremony in April 1953.

SCOPE AND FUNCTIONS

While many of the problems for investigation in India are similar to those in other countries, there are some which are of special interest to India, such as, factors governing comfort and efficiency under tropical conditions, study of soil stabilization, use of indigenous materials, utilization of industrial wastes, and construction of houses for persons of low income on an extensive scale.

Within the framework laid down by the Building

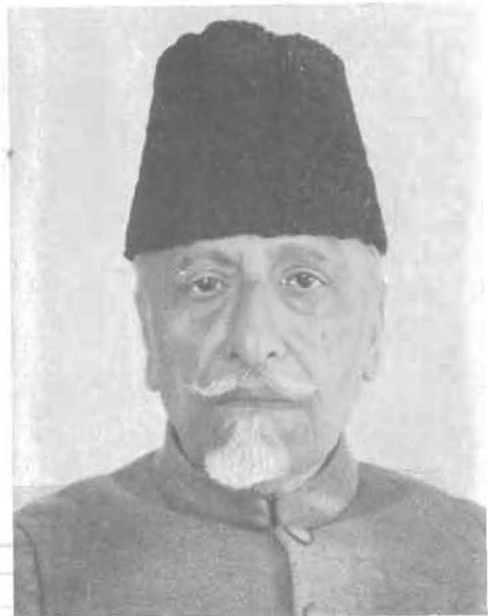


*Shri Jawaharlal
Nehru, Prime Minister
and President,
Council of Scientific
& Industrial Research*

Research Committee the work of the Institute will deal with the four principal groups of problems in building construction, viz., (i) building materials, (ii) methods of construction, (iii) performance of buildings, and (iv) survey and information.

Building materials—Investigations on the basic indigenous building materials, such as soil, bricks, tiles, lime, cement and bamboo to establish their best uses in their present state, improvement in their respective qualities, and new outlets for their industrial application. Typical problems under this head are: (i) stabilization of soil;

*Maulana Abul Kalam
Azad, Minister for
Natural Resources
and Scientific Re-
search and Education
and Vice-President,
Council of Scientific
& Industrial Research
opens the Institute*



(ii) improvement in the quality of bricks; (iii) making of lightweight and hollow building blocks; (iv) development of expanded clay products, vermiculite and lightweight concrete; (v) application of precast concrete and prestressed concrete; (vi) possible use of bamboo as a reinforcing material.

Improvement in the quality of building materials and the reduction in their costs will be one of the main items in the programme of the Institute. The problem of finding uses for the many industrial waste products and the introduction of new efficient building materials based on systems

matic search and testing of novel production processes come next in importance.

Methods of construction—Improvements in existing construction methods as well as the reduction in their costs are of prime importance. Time studies and detailed technological analyses of the various methods used show the way for their improvements. Investigations on novel construction methods which may have been evolved by the Institute itself or which may have been brought to its

notice from outside, construction schedules, organisation and rationalisation of building sites, mechanical equipment, accurate timing of building operations, and prefabrication and assembly of building components, are a few more items coming under this group.

Performance of buildings—Under this heading, the Central Building Research Institute will establish, on the basis of experimental investigations in the laboratory and



*Shri K. D. Malaviya, Deputy Minister for
Natural Resources & Scientific Research*



*Dr. S. S. Bhatnagar, Secretary, Ministry of
Natural Resources & Scientific Research
and Education and Director, Council of
Scientific & Industrial Research*



*Dr. K. Billig, Director, the Central
Building Research Institute, Roorkee*



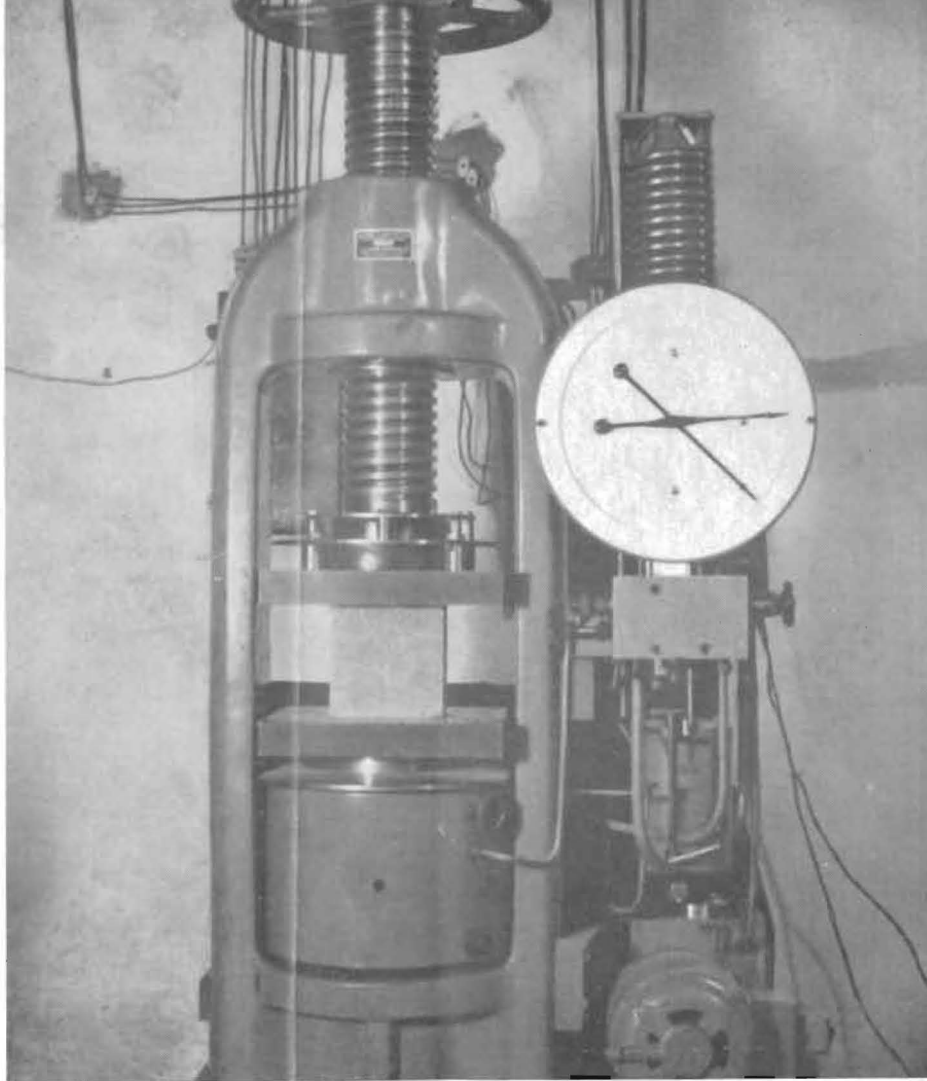
Shri Sri Prakasa laid the foundation-stone of the Institute, February 10, 1951

in the field, quantitative values of performance specifications of buildings, such as strength and stability, heat and sound insulation, resistance to moisture penetration, weather resistance and fire resistance. Following the investigations on performance, architectural and structural designs may be improved by substituting new performance specifications to take the place of old volume specifications. This work will have to be done in close co-operation with the Indian Standards Institution as it involves the drafting of new standard specifications.

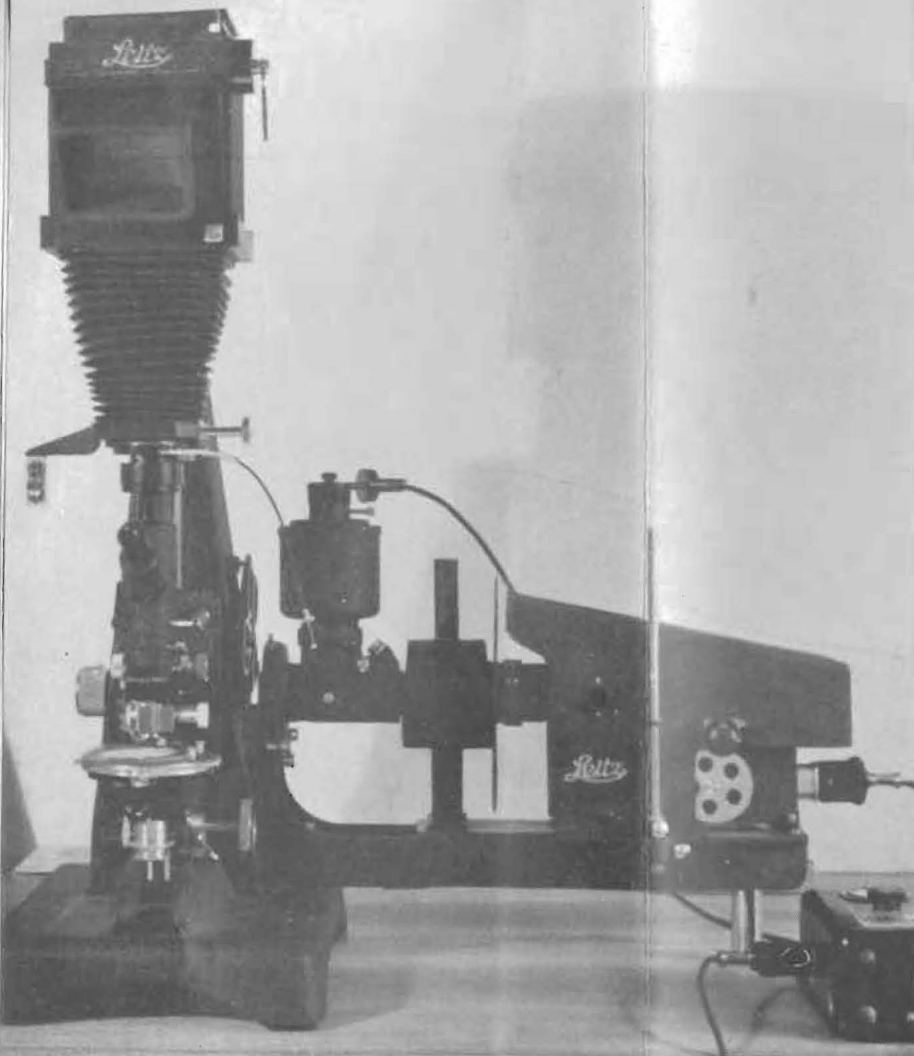
Survey and information—A number of surveys on building materials, building construction, and building industry will be carried out on national and regional scales.

Surveys will serve to assess the capacity of the building industry of India and to co-ordinate its development with the Five-Year Plan. Such surveys will deal with the availability and the distribution of the principal raw materials, the existing production centres, their annual output and their maximum capacities, the type and amount of building material imported from abroad, the advisability of expansion of certain production centres, etc. High priority will be given to those dealing with the brick industry, lime industry, and industrial waste products. Preliminary surveys on the present position of brick manufacture in India and on present construction types of village housing have already been carried out.

Practical results obtained by research investigations or useful information obtained from surveys will be made available to the building industry in a form ready for



Amsler 200 ton Press



Panphot Microscope

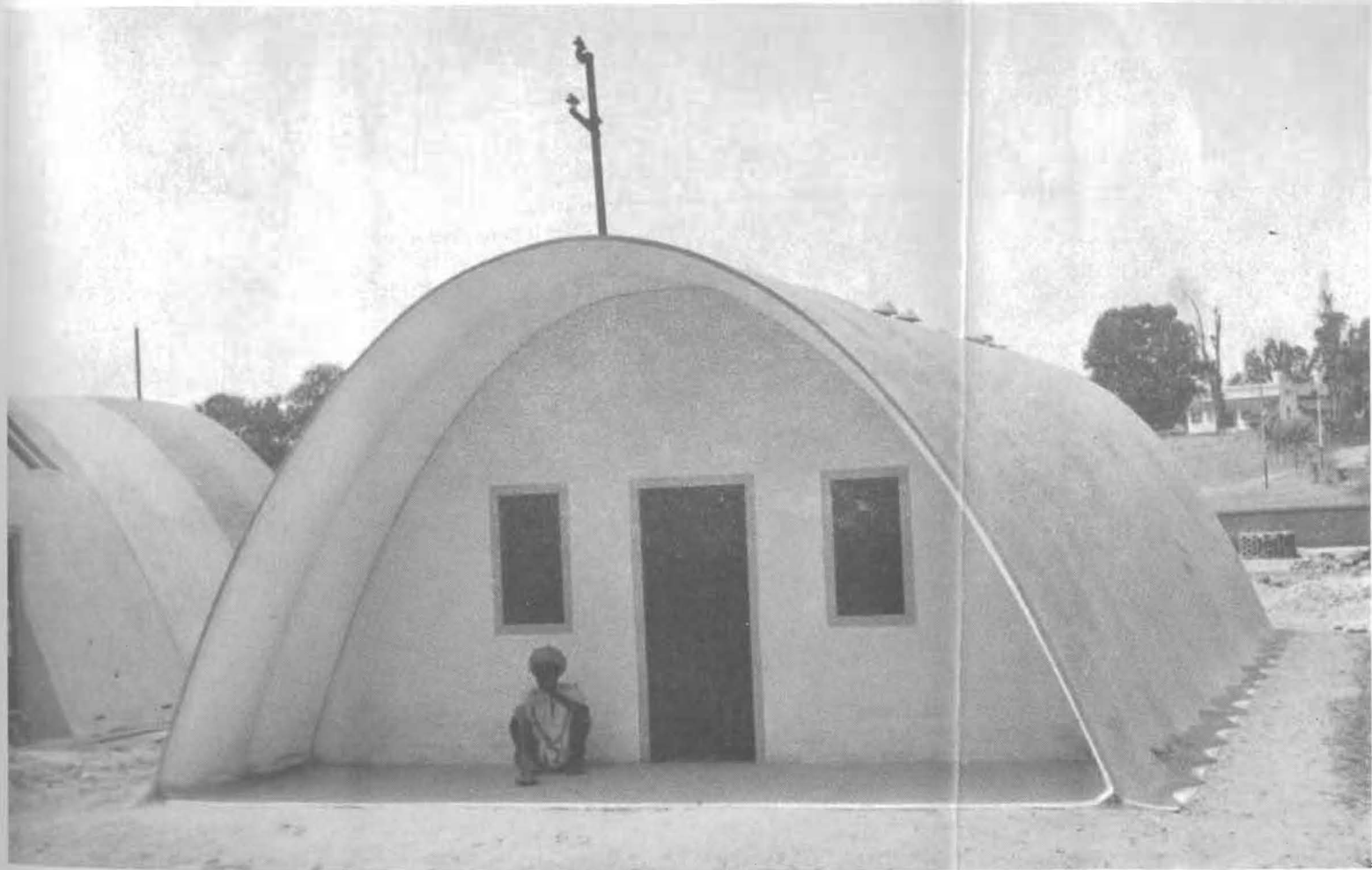
application to practical works. Apart from the publication of scientific and technical papers and statistical reports, popularised versions of practical information will be published and widely distributed so as to reach the largest possible cross-section of engineers and technicians employed in the building industry, on the manufacturing as well as on the construction side.

ORGANISATION, BUILDINGS AND EQUIPMENT

The activities of the building industry are two-fold in character. They cover the development and manufacture of the various building materials; they also deal with the use of the materials in the actual construction of buildings. Accordingly, the Building Research Institute comprises Divisions dealing with the production and testing of building materials as well as with the construction and testing of structures. These activities call for the team work of chemists, physicists and engineers.

The scientific and technical work of the Institute is organized in the Divisions of Chemistry, Architectural Physics and Engineering. There are also Departments dealing with specific projects of long duration, as distinct from projects which can be treated in any of the three main Divisions. Apart from Administration, there is also a Division for Information Service. This Division includes sections dealing with surveys and statistics, publication and information, library and museum.

The capital grant for building and equipment is Rs. 2 lakhs. The total recurring expenditure covering the estab



Experimental House erected at the Institute

ishment, and renewal and replacement of equipment will be Rs. 5 lakhs when the Institute is fully staffed.

The Institute has been constructed on a site of 10 acres. An additional area of 57 acres has been acquired for further expansion and for residential accommodation of the staff

There are four blocks in the main buildings :

(1) The Main Block having a floor area of 29,000 sq. ft contains the chemical and physical laboratories and the administrative offices. It is a two-storey building with a basement to house the stores.

(2) The Technological Block with a floor area of 16,000 sq. ft. consists of laboratory rooms and five sheds. Two sheds are housing the soil mechanics laboratory, two sheds the workshop, and one is reserved for the development of industrial projects. It is now used for a pilot plant for twin-twisting of steel bars to be employed as reinforcements in concrete construction.

(3) The Library and the Museum Block has a floor area of about 3,000 sq. ft. The library, housing the first instalment of a highly specialised collection of books and journals on building materials and building construction, is to be extended under the programme sanctioned for the next year. The museum contains exhibits of building materials, ancient and modern, small tools used in building construction, and samples of fittings and equipment used in buildings. This temporary exhibition forms the nucleus of a permanent Building Centre to be established next year.

(4) The Auditorium Block with a floor space of 4,000 sq. ft. contains a lecture hall with 250 seats.

A hangar covering a floor area of 30,000 sq. ft. positioned on a separate ground is to provide cover for some of the pilot schemes envisaged under the development programme of the Institute.

A part of the Institute ground is reserved for the exhibition of experimental structures. At present, a number of experimental houses, such as low-cost houses of corrugated concrete shell type and a precast house of prestressed concrete units, have been erected in this area.

Extension—The plan for the financial year 1953-54 provides for three large sheds to house the concrete laboratories, the structure testing laboratories, and also a pilot plant for prestressed concrete construction and similar projects.

Equipment—The major items of equipment, already received and erected, fall under the following groups: Equipment for the testing of structures; Equipment for the testing of building materials; Concrete testing equipment; Soil testing equipment; and Workshop equipment.

There are also provided a number of special outfits, such as those used for differential thermal analysis, catharometer for ventilation studies, a petrological microscope, and universal testing machines for material testing.

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BUILDING RESEARCH COMMITTEE

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Mr. S. R. Mehra	Dr. E. Zipkes	Industrial Research
Major-General H. Williams	Dr. V. I. Vaidyanathan	Director, Central Building
Dr. C. A. Hart	Mr. K. F. Antia	Research Institute

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