

The Committee has deliberated at great length as to what should constitute the minimum requirements of strength and on the other aspects of the questions involved in securing adequate design in the future. Its conclusions have been embodied in a draft General Earthquake Building By-law, which is given in Appendix I. This draft covers the important factors of design, workmanship, and inspection during construction, and sets out what are considered to be minimum standards which should govern all construction in New Zealand, and requires that all new buildings shall be designed to withstand a horizontal acceleration equal to one-tenth of the acceleration due to gravity. Provision is made therein allowing local authorities to demand a higher standard of construction in localities which might be subject to specially severe earthquake forces. It is important that all local authorities controlling building operations take steps, in due course, to have this General Earthquake Building By-law incorporated in their own by-laws. To this end, it is recommended that the Government should issue regulations embodying this model by-law for the guidance of local authorities.

The enactment of this General Earthquake Building By-law throughout New Zealand will, in itself, lead to greatly improved design of buildings, provided the by-law is strictly enforced. Adequate enforcement implies that local authorities shall have the necessary staff to examine plans, and also that owners shall engage competent designers for the preparation of designs. It implies, further, that the work shall be supervised during construction in a very rigorous manner.

Designers in future will be expected to equip themselves with the special knowledge required to enable buildings to be designed in an economical manner to withstand earthquake forces. Such knowledge can only be gained by a special study of this branch of mechanics, which is of modern development. In order that the designing shall be both economical and effective, full use must be made of the scientific methods of design which have been evolved, notably in America and Japan, within the last few years.

The horizontal force which the Committee has decided should be used in design has been chosen as the minimum which should be adopted all over New Zealand. The selection of this value of one-tenth gravity, coupled with a very considerable increase in allowable working-stresses, has been made after due consideration of all aspects of the problem. It is impossible at the present time to evaluate exactly the earthquake risk involved in different districts, and this is a matter which requires further investigation. A request for information has been addressed to the Japanese and Italian Governments, and when this comes to hand it may be of direct assistance in the solution of this particular problem.

At the present time, also, important investigatory work is being carried on abroad in regard to the vibrations set up by earthquakes in soils of different properties and on sites variously located, and it is to be hoped that before very long we shall be able to contrast reliably the risks on, say, an alluvial plain with those on an adjacent hilly formation. At the present time opinions on this particular subject differ widely. The Committee has, therefore, put forward a minimum force to be designed against in all cases, and has left to local authorities the duty of requiring a higher value in their own districts in cases where they consider this to be necessary. The fact that the Committee has put forward a certain minimum value, with provision for a higher value at the discretion of the local authority in the meantime, must only be taken as an indication that there are districts in which a higher value will be necessary. Reference is also made in the General Earthquake By-law to the advisability of applying a higher value in the case of buildings of certain occupancy and on sites which are now known to be particularly dangerous.

*Uniform Building Code.*—The Committee has come to the conclusion that a general improvement in the standard of building-construction, in particular in relation to resistance to earthquake forces, can most economically be brought about by the issue of a detailed Uniform Building Code for the Dominion. The preparation of such a code would involve very many months of careful compilation, and was therefore outside the scope of the Committee's work. It is felt, however, that the preparation of a uniform code might, with great advantage to the Dominion, be undertaken by the Public Works Department, in consultation with the various interested bodies.

At present each municipality has its own set of building by-laws, many of which are now quite out of date. This seems an appropriate time, therefore, to introduce some measure of uniformity in our building by-laws. From the designers' point of view particularly, some standardization of the working stresses to be adopted for different materials is highly desirable.

A uniform building code might well include tables for use in the drawing-office in connection with the design of structures in steel and reinforced concrete. Such tables should be prepared to cover the usual floor-areas and story-heights in common use, and the standard floor-loadings which have been