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Guidelines for Loading and Safety Regulations for Structural Design

Directives pour les règlements de charge et de sécurité des structures de génie civil

Richtlinien für Belastungs- und Sicherheitsvorschriften im konstruktiven Ingenieurbau

The Joint Group for Structural Matters
of the Nordic Committee on Building Regulations

The Nordic Committee on Building Regulations - NKB - is a joint committee for the national building authorities in Denmark, Finland, Iceland, Norway and Sweden. One of the most important aims of the committee is the coordination of the building regulations in the five countries.

The authorities represented in the committee are:

Denmark: The National Building Agency

Finland: The Ministry of the Environment

Iceland: The Directorate of Town and Country Planning

Norway: The National Office of Building Technology and Administration

Sweden: The Swedish National Board of Physical Planning and Building

The first edition of the guidelines for loading and safety regulations for loadbearing structures appeared in 1978 and laid the foundations for the national safety codes which were drawn up in the Nordic countries in the following years.

These guidelines were prepared in cooperation with international bodies on structural safety and have later set the pattern for other international recommendations regarding safety issues.

Somewhat differing practice in the five Nordic countries has led to the national codes deviating on some points from the guidelines. The Joint Group for Structural Matters made a comparison of the national codes and came to the conclusion that a minor revision of the guidelines would promote the harmonization of these codes.

The Joint Group also considered that the guidelines should be supplemented in view of the international development in the area of structural safety and the Nordic Committee on Building Regulations recommended that a revision be carried out.

The new edition of the guidelines appeared in 1987 as NKB-Report No. 55E entitled "Guidelines for Loading and Safety Regulations for Structural Design" (1)

SPECIAL FEATURES OF THE GUIDELINES:

Structures are assigned to one of three safety classes - low, normal and high - on the basis of consequences of failure in terms of personal injuries and public loss.

Distinction is made between three different types of failure - ductile with capacity reserve, ductile and brittle.

Inspection shall be carried out on design, materials, construction and condition according to one of three inspection classes - moderate, normal and stringent.

Requirements regarding the safety of a loadbearing structure are expressed in terms of the safety index β . The formal probability of failure is a function of the safety index.

Action, defined as causes which may give rise to changes in stresses, strains, strength or stiffness of a structure, are classified into loads, induced deformations and environmental actions.

Actions which occur simultaneously are combined according to rules that take account of the temporal variations of the individual actions and the probability of one or more actions occurring simultaneously with high values. The combinations are considered in the ultimate limit state and in the serviceability limit state.

In the ultimate limit state, the partial coefficient γ_m by which the material parameter is divided, is a product of five subfactors. When the serviceability limit states are investigated, γ_m is normally put equal to unity.

The probabilistic method described in Appendix B may be used directly in designing loadbearing structures, however, the essential significance of the method is that it constitutes a logical and consistent instrument for calibrating other methods, for instance the method of partial coefficients.

The "Comments"-section of the Report describes how values of the partial coefficients for loads and strength and the safety index may be determined.

REFERENCE

- (1) Guidelines for Loading and Safety Regulations for Structural Design. The Nordic Committee on Building Regulations-NKB, Report No 55E. June 1987.

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