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Bases for design of structures — Seismic actions on structures

Bases du calcul des constructions — Actions sismiques sur les structures

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www. iso. org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso. org/iso/foreword. html.

This document was prepared by ISO/TC 98, *Bases for design of structures*, Subcommittee SC 3, *Loads, forces and other actions*.

This third edition cancels and replaces the second edition (ISO 3010:2001), which has been technically revised.

Introduction

This document presents basic principles for the evaluation of seismic actions on structures. The seismic actions described are fundamentally compatible with ISO 2394.

It also includes principles of seismic design, since the evaluation of seismic actions on structures and the design of the structures are closely related.

Annexes A to P of this document are for information only.

NOTE 1 ISO 23469 and ISO 13033 are companion documents to this document. They provide basic design criteria for geotechnical works and for nonstructural components and systems, respectively.

NOTE 2 ISO 23469 specifies the procedure to determine the design ground motion for the dynamic analysis of geotechnical works. The procedure in ISO 23469 is applicable to the generation of design ground motion for the structures that exhibit interaction with the ground or the geotechnical works.

NOTE 3 ISO 13033 and its annexes use the same terms and definitions that are used in this document. The ground motion criteria specified in ISO 13033 are the same criteria that are used in this document. The demand on nonstructural components and systems is directly related to the response of the building in which they are located. Therefore, the procedures used to determine the design ground motion and building seismic response are directly referenced to this document.

Bases for design of structures — Seismic actions on structures

1 Scope

This document specifies principles of evaluating seismic actions for the seismic design of buildings (including both the super structure and foundation) and other structures.

This document is not applicable to certain structures, such as bridges, dams, geotechnical works and tunnels, although some of the principles can be referred to for the seismic design of those structures.

This document is not applicable to nuclear power plants, since these are dealt with separately in other International Standards.

In regions where the seismic hazard is low, methods of design for structural integrity can be used in lieu of methods based on a consideration of seismic actions.

This document is not a legally binding and enforceable code. It can be viewed as a source document that is utilized in the development of codes of practice by the competent authority responsible for issuing structural design regulations.

NOTE 1 This document has been prepared mainly for new engineered structures. The principles are, however, applicable to developing appropriate prescriptive rules for non-engineered structures (see Annex N). The principles could also be applied to evaluating seismic actions on existing structures.

NOTE 2 Other structures include self-supporting structures other than buildings that carry gravity loads and are required to resist seismic actions. These structures include seismic force-resisting systems similar to those in buildings, such as a trussed tower or a pipe rack, or systems very different from those in buildings, such as a liquid storage tank or a chimney. Additional examples include structures found at chemical plants, mines, power plants, harbours, amusement parks and civil infrastructure facilities.

NOTE 3 The level of seismic hazard that would be considered low depends not only on the seismicity of the region but also on other factors, including types of construction, traditional practices, etc. Methods of design for structural integrity include nominal design horizontal forces (such as an equivalent static loading determined from a simplified equivalent static analysis) which provide a measure of protection against seismic actions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13033, *Bases for design of structures — Loads, forces and other actions — Seismic actions on nonstructural components for building applications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp