An Introduction to the Guidelines for Seismic Design of Buildings

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Summary

After an eight years effort for preparation, the “Guidelines for Seismic Design of Buildings” – the first Chinese Model Code for seismic design of buildings was officially approved and promulgated in China. The so called “Guidelines” in Chinese language is meant as an advanced technical document with the purposes of providing a technical bases for preparing the national, regional, and/or local design codes, and providing technical sources and references to designers in solving some technical issues rising from the engineering design that are not addressed in the current codes. However, the “Guidelines” itself is not necessary for enforcement.

The main features of the “Guidelines” are presented in this paper and that can be summarized as follows.

1. The new three steps approach for determining the seismic design ground motion is applied instead of the traditional two steps approach. The traditional approaches consist of determination of basic seismic design motions as well as the design ground-motions for frequently and rarely occurred earthquakes and the coefficients of importance of the designed structures respectively. The new approach takes one more step in comparing with the traditional one that is to determine the desired category of performance level of the designed structures.

2. The “Guidelines” adopts a new way to interpret the category of importance of the designed structures and a more reasonable method to determine the coefficients of importance of the structures. The more important structures will take longer basic period with the same probabilities of exceedance in determining its seismic design ground motion than do less important ones.

3. The “Guidelines” provides seismic design ground motions with various probabilities of exceedance for more than two thousand cities and towns in China based upon the detailed seismic hazard analysis for each city and town.

4. A trapezoid method is used in the “Guidelines” for categorizing the seismic site where the designed structures will be constructed and determining the respective characterized period of the site in stead of the traditional rectangular method.

5. A most unfavorable seismic design ground-motion is recommended to be used for nonlinear seismic analysis of the structures with higher category of importance.

6. A “Quality Assurance” measure is particularly emphasized in the “Guidelines”. The requirement of the “quality assurance” is not only regulated in the “General Provisions” but also listed in detail in each chapter.

7. Some new provisions have been recommended in the “Guidelines”, such as design method for composite structures and some individual structures where the effects of P-Δ, or torsion effects are necessarily to be
considered, criterion for soil liquefaction judgment, design of isolated structures during the rarely occurred earthquakes, design methods for non-structural elements including of curtain walls etc.