

## Alternative Method of Determining Seismic Loads on Buildings Without Response Spectrum Application

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**Abstract :** This article discusses a new alternative method for determination of seismic loads on buildings, based on resistance of structures to deformations of vibrations. The basic principles for determining seismic loads by spectral method were developed in 40... 50ies of the last century and further have been improved to pursuit true assessments of seismic effects. The base of the existing methods to determine seismic loads is response spectrum or dynamicity coefficient  $\beta$  (norms of RF), which are not definitively established. To this day there is no single, universal method for the determination of seismic loads and when trying to apply the norms of different countries, significant discrepancies between the results are obtained. On the other hand there is a contradiction of the results of macro seismic surveys of strong earthquakes with the principle of the calculation based on accelerations. It is well-known, on soft soils there is an increase of destructions (mainly due to large displacements), even though the accelerations decreases. Obviously, the seismic impacts are transmitted to the building through foundation, but paradoxically, the existing methods do not even include foundation data. Meanwhile acceleration of foundation of the building can differ several times from the acceleration of the ground. During earthquakes each building has its own peculiarities of behavior, depending on the interaction between the soil and the foundations, their dynamic characteristics and many other factors. In this paper we consider a new, alternative method of determining the seismic loads on buildings, without the use of response spectrum. The following main conclusions: 1) Seismic loads are revealed at the foundation level, which leads to redistribution and reduction of seismic loads on structures. 2) The proposed method is universal and allows determine the seismic loads without the use of response spectrum and any implicit coefficients. 3) The possibility of taking into account important factors such as the strength characteristics of the soils, the size of the foundation, the angle of incidence of the seismic ray and others. 4) Existing methods can adequately determine the seismic loads on buildings only for first form of vibrations, at an average soil conditions.

**Keywords :** seismic loads, response spectrum, dynamic characteristics of buildings, momentum

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