

## Self-centering Aseismic System with Double Natural Frequency

The proposed system is based on the following operations:

- interruption of the solidarity between the building and the foundation-soil complex;
- laying of multidirectional movable elastic bearings with sliding or rolling friction.

This application confers the building with the main properties of centering after an earthquake and of doubling the natural frequency of vibration during an earthquake.

The centering is automatic and it takes place due to the presence of a sliding spherical bowl in each bearing.

During an earthquake, this bowl also permits the building to remain immobile with respect to the horizontal translation of the foundation-soil complex, because, at every instant and for any horizontal displacement value, its thickness variation is perfectly balanced by the corresponding elastic deformation of the main springs.

The horizontal inertial force in the building does not modify its static equilibrium, because it is minor when using bearings with sliding friction and negligible when using bearings with rolling friction.

The variation in the natural frequency of the building occurs during the vertical motion of the soil only during an emergency, characterized by an interval of seismic frequencies including the resonance frequency. In fact, the presence in each bearing of a system of auxiliary springs, automatically started up in this situation, allows the action of the main springs to strengthen, with a consequent increase in the natural frequency of the building and a drastic decrease in the vertical displacements of the building to values compatible with its safety characteristics.