



Preface

This monographic study develops my previous publication, *Idea of a New Building System in Seismic Areas*, which is obtaining approval from foreign Seismic Engineering Research Centers. Although the system remains the same, this study may be considered as a variation since it partly simplifies the structure and improves its application. In fact, it examines the possibility of using suitable devices with the double function of acting as fixed bearings, in the absence of an earthquake, and as multidirectional movable bearings, with a low friction coefficient, during an earthquake, therefore substituting the anti-seismic side linkages.

However, the system still retains a considerable number of the features of previous project, such as:

- ## rigid translation of the foundation-soil complex with respect to the building, which remains almost motionless, under the prevailing action of the weight force, during an earthquake;
- ## a reduction of around 90% in the seismic energy in the building;
- ## potential application even to structures with very low resonance thresholds, due to the almost total absence of a natural frequency of the building, provided that the friction coefficient is low;
- ## in the event of an earthquake, a substantial decrease in the psycho-physical uneasiness of the inhabitants;
- ## easy maintenance of the bearings;
- ## competitive cost in comparison with the anti-seismic systems by means of which the seismic energy is partially or totally transmitted to the building. The comparatively higher cost for the foundation structure and for the electromechanical devices used as bearings is offset by the substantial cost-savings for tall buildings, because the structures are not over-dimensioned.

Unlike the previous system, in which a circular platform must be built under the building, this system can be adapted to buildings of any planimetric shape, due to the particular characteristics of the bearing, which is at the same time cantering and locking.

This system is based on the following operations:

- €# breaking the continuity between the building and the foundation-soil complex, by making shears in the pillars placed between the building and the foundation-soil complex;
- €# fitting these shears with appropriate devices with the double function of acting as fixed bearings in the absence of an earthquake, and as movable multidirectional bearings in the event of an earthquake.

The movable bearing can be with sliding friction, with surface contact, if for example PTFE is used (pure Teflon with silicone grease), or with rolling friction, with exact hertzian contact, if traditional steel balls are used, together with a steel sliding surface. The bearing, with or without the dissipating capacity of sub-undulatory shock, may be of two different types: compound or monoblock.

However, in this system the cantering of the building after an earthquake is not automatic, but is achieved by means of the elastic reaction of the pre-stressed auxiliary springs, which are an integral part of the bearing. I would like to point out that, like the previous system, this system, requires accurate experimental testing.

The proposed system is active in the sense that the cantering and the locking of the building after an earthquake do not occur automatically, but are achieved by activating an appropriate electronically powered device.