

1.4. GENERAL GUIDELINES FOR ARRANGEMENT OF BUILDING STRUCTURAL SYSTEMS

1.4.1. Structural simplicity

1.4.1.1 – Structural simplicity is characterised by the existence of clear and direct paths for the transmission of the seismic forces.

1.4.1.2 – Modeling, analysis, dimensioning, detailing and construction of simple structures are subject to much less uncertainty and thus the prediction of their seismic behaviour is much more reliable.

1.4.2. Uniformity, symmetry and redundancy

1.4.2.1 – Uniformity in plan is characterised by an even distribution of the structural elements which allows direct transmission of the inertia forces created in the distributed masses of the building. If necessary, uniformity may be realised by subdividing the entire building by seismic joints into dynamically independent units, provided that these joints are designed against pounding of the individual units in accordance with **2.7.2**.

1.4.2.2 – Uniformity in the development of the structure along the height of the building is also essential, as it tends to eliminate the occurrence of sensitive zones where high stress or ductility demands might concentrate.

1.4.2.3 – A similarity between the distribution of masses and the distribution of resistance and stiffness eliminates large eccentricities between mass and stiffness.

1.4.2.4 – If the building configuration is symmetrical or quasi-symmetrical, a symmetrical layout of structural elements, which should be well-distributed in-plan, is appropriate for the achievement of uniformity.

1.4.2.5 – The use of evenly distributed structural elements increases redundancy and allows a more favourable redistribution of action effects and widespread energy dissipation across the entire structure.

1.4.3. Adequate resistance and stiffness

1.4.3.1 – Horizontal seismic motion is a bi-directional phenomenon and thus the building structure shall be able to resist horizontal actions in any direction. In this respect, structural elements should be arranged in an orthogonal in-plan structural pattern, ensuring similar resistance and stiffness characteristics in both main directions.

1.4.3.2 – In addition to lateral resistance and stiffness, building structures should possess adequate torsional resistance and stiffness in order to limit the development of torsional motions which tend to stress the different structural elements in a non-uniform way. In this respect, arrangements in which the main elements resisting the seismic action are distributed close to the periphery of the building present clear advantages.