

REPORT ON SEISMIC UNDERSTANDING AND GENESIS ANF DEVELOPMENTS

This lecture was conducted by Dr. Pratima Bose about managing earthquake disaster through Architecture and Planning. Natural hazards with vulnerability increase disaster risks. Higher the vulnerability higher the hazards and extreme events by the seismic events. The effects of earthquakes are ground shaking, ground failure, tsunamis, fire. The ground motion is not predictable. Sometimes it goes to and fro or towards and backwards and also combined effects of shaking of the earth. The ground shaking in the other direction and the inertia of the building (x) moving in the opposite direction which tends the structure to fail its ability of standing properly while earthquake.

The key players in building industry are the owner, consultant department, architect, structural engineer, geo-technical engineer, MEP engineer, contracting agency. The causes of building collapses are layout irregularities, torsion, structural irregularity, framing deficiency, failing in details, short column effects, and many more. Whenever designing the earthquake prone structure, first analyse the case and then go for the design. The materials to be used for helping the structure maintain its position even while ground shaking are mud, stone dressed/rubble, brick burnt clay, pre cast cc blocks, RCC, steel, timber, mortar.

The concept for the designing of earthquake prone structures should be energy concept, with sufficient strength and ductility and elastic behaviour of high forces. Then the graph that shows the basic behaviour of the structures. If the graph is completely straight then it is elastic, if the graph line is slightly tilted 15 degree it is brittle, then the 3rd line is the most favourable for a building structure which is ductile and tough and it also calculates the life span of the building.

India has divided in 4 zones according to the seismic zones. In India there are zone 2, zone 3, zone 4 and zone 5. The earthquake and shaking of structure is directly compared to the inwards perpendicular. The height of the building is directly proportional to the falling stress of foundation.

TORSION: provision that shall be made in all buildings for the increase in shear forces on the lateral force resisting elements resulting from twisting about the vertical axis of the building, arising due to eccentricity between the centre of mass and centre of stiffness at the floor levels.