

Earthquake Resistant Building and Disaster Management

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EARTHQUAKE:

- Earthquake occurs when to tectonic plates move suddenly against each other.
- Earthquake is also known as temblors.
- Waves spread from the epicenter, the point on the surface above the hypo centre.
- During earthquake rock suddenly shift from their position and fracture occur on the earth surface.
- Ground shaking from earthquake can collapse buildings, bridges, phone services etc.,

TECHNIQUES TO RESIST EARTHQUAKE

- Active and passive system
- Shear walls
- Bracing
- Dampers
- Rollers

- Isolation

- Light weight material
- Bands
- Others

BASE ISOLATION

- Introduce flexibility to the structure.
- Building is rested on flexible pads (base isolators)
- When earthquake strikes the building does not moves
- It is suitable for hard soil only
- In India base isolation technique was first demonstrated after 1993 killari earthquake.

SEISMIC DAMPERS

TYPES OF SEISMIC DAMPERS

- Viscous dampers (energy is absorbed by silicone-based fluid passing between piston cylinder arrangement).

- Friction dampers (energy is absorbed by surfaces with friction between them rubbing against each other).
- Yielding dampers (energy is absorbed by metallic components that yield).
- Viscoelastic dampers (energy is absorbed by utilizing the controlled shearing of solids).
- Immediate steps must be taken to preserve our environment for our future generation.

SHEAR WALL

- Vertically oriented wide beams
- It carries seismic loads down to the bottom of foundation
- Provides large strength and stiffness to buildings.
- Thickness generally varies from 150mm to 400mm in high rise buildings.

“AVOID SOFT STOREY- CONTINUE WALLS IN GROUND STOREY”

LIGHT WEIGHT MATERIAL

- The group called paksbab is to find the solution for all problems.

- It is to protect and improve the lives of the poor, especially in seismic and temperature region.
- It is simple load bearing design.
- Made with locally fabricated compression moles and manually operated form jacks.

BANDS

- Strong column, weak beam
- Horizontal band necessary through the masonry(a building with no horizontal linet band collapse of roof and walls).
- Latur earthquake incident(a building with horizontal linet band in killari village: no damage).

KEEPING BUILDING UP-RIGHT

- When the quakes strikes the system dissipates energy in the building cores and exteriors.
- The frames are free to rock up and down within fittings fixed at their bases.
- Recently discovered technique of japan

- It has found to be survived even in extreme earthquakes.

QUALITY CONTROL

- Regular testing of construction material at qualified laboratories.
- For example, testing of bricks.
- Period training of workmen at professional training house.
- Onsite evaluation of the technical work.

IS-CODES

- Is 1893 (part i), 2002, indian standard criteria for earthquake resistant design of structures (5th revision)
- Is 4326, 1993, indian standard code of practice for earthquake resistant design and construction of buildings (2nd revision)
- Is 13827, 1993, indian standard guidelines for improving earthquake resistance of earthen buildings

- Is 13828, 1993, indian standard guidelines for improving earthquake resistance of low strength masonry buildings

- Is 13920, 1993, indian standard code of practice for ductile detailing of reinforced concrete structures subjected to seismic forces

CONCLUSION

- We civil engineers are here only to provide safety to public to lead their life happily.
- Let us work together to build a cultu