Contents:

HIGH RISE BUILDING

- PRINCIPLES OF HIGH-RISE BUILDINGS
- FORCES ACTING ON HIGH-RISE BUILDINGS
- EFFECT OF HORIZONTAL LOAD ON HIGH-RISE BUILDINGS

INTRODUCTION:

- High-rise buildings are commonly constructed in densely populated cities or urban areas. Constructions of high rises a building provide a comfortable living standard for the people and also help in the planning of the cities.
- The first requirement for the construction of any type of building is planning. Planning is important for the construction of high-rise buildings to complete the work in time.
- The estimation of material and the requirement of the material must be mentioned before the construction work. Before the construction starts, how the works should go, and what are the requisites and steps to be followed:

➢ what kind of problems may arrive and how to tackle them

➢ are the important task one need to include in the planning

➢ scheduling of work from excavation, and construction of foundation to finishing through the erection of frame and walls.

INTRODUCTION:

- A multi-story structure between 35–100 meters tall, or a building of unknown height from 12–39 floors.
- A high-rise is a tall building or structure: Buildings between 75 feet and 491 feet (23 m to 150 m) high are considered high-rises.
- Buildings taller than 492 feet (150 m) are classified as skyscrapers
- **Demand for high-rise Building**
  - 1. Scarcity of land in urban areas
  - 2. Increasing the demand for business and residential space
  - 3. Economic growth
  - 4. Technological advancements
  - 5. Innovations in structural systems
  - 6. Desire for aesthetics in urban settings
  - 7. Concept of the city skyline
  - 8. Cultural significance and prestige

Structural Loads:

- Gravity loads

Dead loads

Live loads

Snow loads

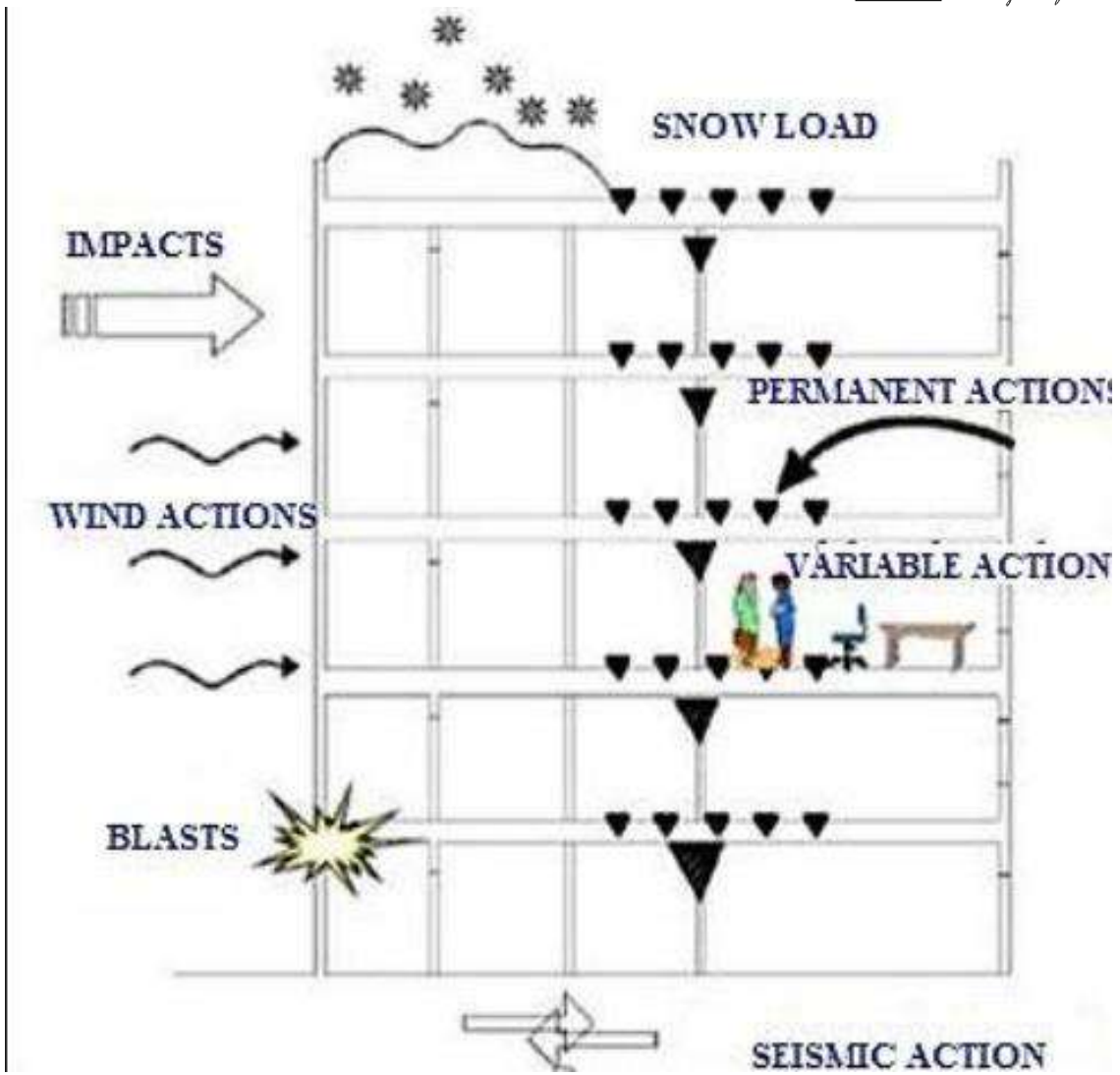
- Lateral loads

– Wind loads

– Seismic loads

- Special load cases

– Impact loads

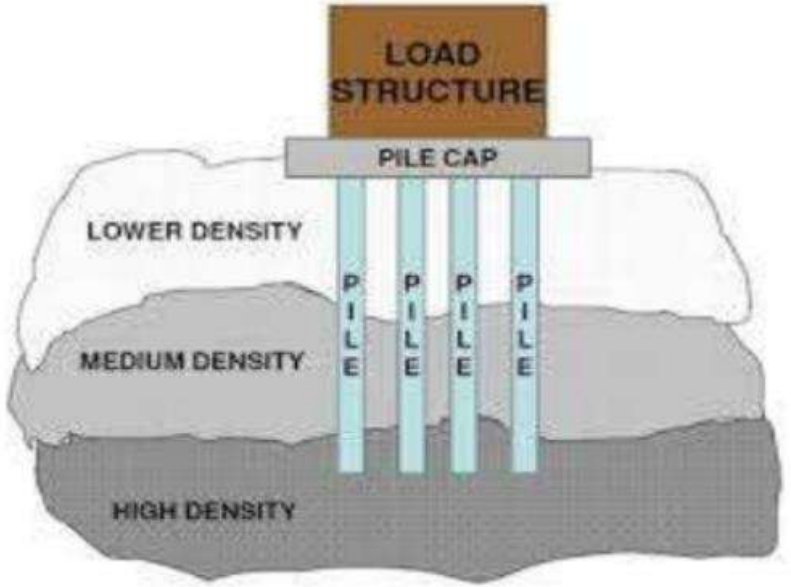


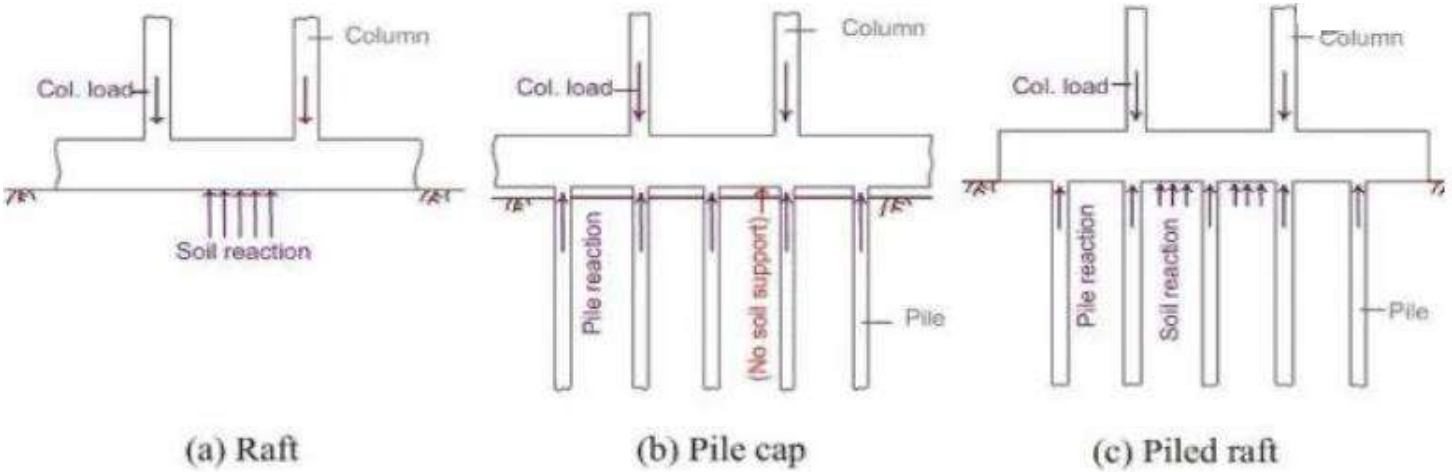
Type of High-Rise Structure:

- 1 Braced Frame
- 2. Rigid Frame Structure
- 3. Infilled Frame Structure
- 4. High efficiency Mega-Braced frame system
- 5. Flat Plate and Flat Slab Structure
- 6. Shear wall structure
- 7. Core Structure system
- 8. Framed tube structure
- 9. The trussed tube
- 10. Bundled tube structure
- 11. Outriggers system
- 12. Tube in tube

Foundation Types :

- Raft foundation: one of the most common foundations. It is known for its load distributing capability. With the usage of this type of foundation, the enormous load of the building gets distributed & helps the building stay upright and sturdy.
- Loads are transferred by raft into the ground.
- Pile foundation: used for high-rise construction. A load of buildings is distributed to the ground with the help of piles. Transfer the loads into the ground with an adequate factor of safety.
- A combined raft-pile is the hybrid of 2 foundations. It Consists of both the pile and raft foundation. Useful in marshy sandy soil that has low bearing capacity.





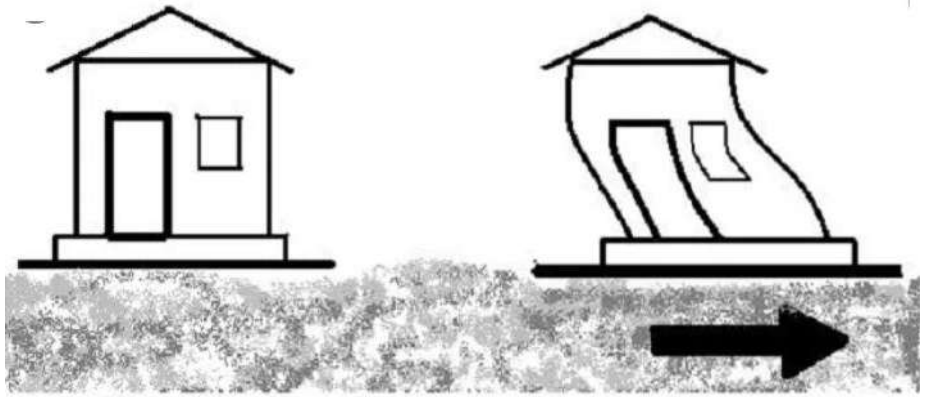
(a) Raft (b) Pile cap (c) Piled raft

Types of Lateral Loads and Their Effect on Buildings

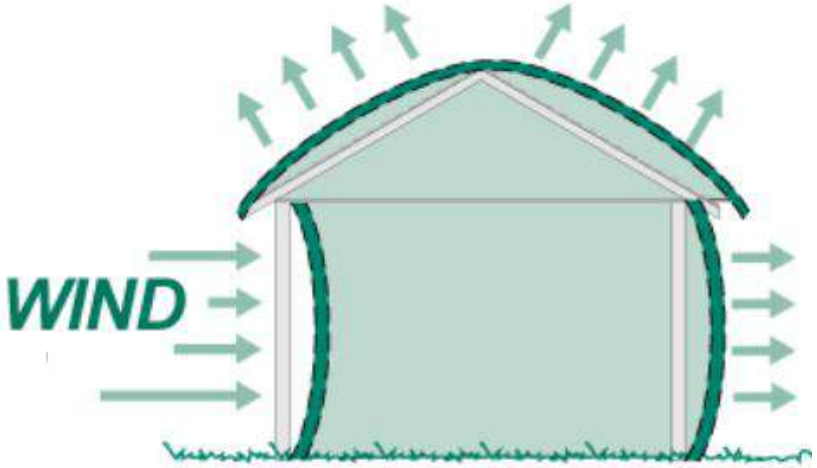
Lateral loads are live loads that act, on a structure/building, parallel to the ground. In other words, lateral loads on a building are forces acting in the horizontal direction on a building. These loads can cause a structure to shear or bend along the direction of the forces.

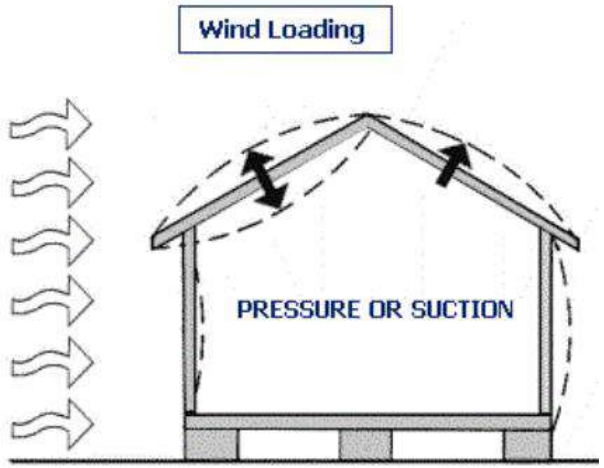
There are different types of lateral loads, the most common ones being Wind and Earthquake loads.

- WIND LOAD
- EARTHQUAKE LOAD



Effect of Inertia in a building when shaken at its base





CONCLUSION:

- The resisting systems for lateral loads (earthquake load and wind load) are similar.
- Designing these systems requires considering both as though they are horizontally applied to the building system.
- Lateral loads also exert constant and instantaneous forces, the wind load falls under the former while the earthquake load falls under the later.
- the magnitude of wind load depends on the height of the building, the shape of the building and the velocity of the wind.
- And the magnitude of the earthquake load depends on the mass of the building, and the proximity of the building to the epicenter.
- It is therefore fair to demand all structures design be done with possible lateral loads in mind.