## 2.4. Various Smoke Control Approaches

**2.4.1.** **The** smoke control Strategy in a facility is broadly classified into two categories.
a. Smoke Containment
b. Smoke Management

**2.4.2. Smoke Containment**

**2.4.2.1.** **The** design objective of a smoke containment approach is to restrict the smoke to its zone of origin and prevent it from spreading to other zones and areas, thus
a. Limiting the spread of toxic gases that can affect occupants, before and during evacuation.
b. Allowing sufficient visibility to the Civil Defence to approach, locate and extinguish the fire.
c. Limiting smoke damage to building contents.

**2.4.2.2.** Smoke containment is achieved through pressure differences in zones, where smoke is prevented from entering a zone with a relatively higher pressure than the pressure of the zone of smoke origin.

**2.4.2.3.** Design pressure differences among the smoke zones shall be based on the following.
a. Smoke zone is sprinklered or non sprinklered.
b. The height of the ceiling in the smoke zone.
c. Maximum and minimum pressure differentials.

**2.4.2.4.** Smoke containment Systems shall be one or a combination of the following systems, based on the building smoke control strategy.

**Did You Know?**

**The major Factors that affect Smoke movement in any building are**

**1.Stack Effect**

**Stack effect and reverse stack effect are the vertical air movements resulting from air density differences between the building spaces, interior or exterior. This effect can cause smoke from fires to spread between floors of tall buildings through vents, stairs, and other shafts.**

**2.Buoyancy and Expansion**

**High-temperature smoke from a fire has a buoyancy (thrust) force due to its reduced density causing the expansion of smoke, which drives smoke from its origin to various paths.**

a. **Stairwell Pressurization System**
b. **Zoned Smoke Control System**
c. **Elevator Pressurization System**
d. **Lobby (Vestibule) Pressurization System**
e. **Smoke Refuge Area Pressurization System**
f. **Opposed airflow to prevent smoke movement between large volume space and communicating space**