

3.4 Fire Safety Norms in Buildings

Fire Safety Norms in Buildings (As per NBC 2016 & BIS Standards)

Fire safety norms are essential to ensure that buildings are resistant to fire hazards, occupants can evacuate safely, and emergency responders can access and control fires efficiently. These norms are defined in Part 4 of the National Building Code (NBC) 2016, and enforced by local fire departments and municipal authorities.

Key Objectives of Fire Safety Norms

- Prevent the **outbreak and spread** of fire.
- Provide **safe evacuation** routes.
- Minimize **loss of life and property**.
- Facilitate **access for fire-fighting personnel and equipment**.

1. Classification of Buildings by Occupancy (NBC Chapter 2)

Group Occupancy Type Examples

A	Residential	Apartments, houses, dormitories
B	Educational	Schools, colleges
C	Institutional	Hospitals, prisons
D	Assembly	Theatres, auditoriums, stadiums
E	Business	Offices, banks, IT parks
F	Mercantile	Shops, malls
G	Industrial	Factories, workshops
H	Storage	Warehouses, cold storage
I	Hazardous	Chemical plants, fuel depots

Fire norms vary by group and building height.

2. Fire Protection Systems (Active Measures)

Fire Detection and Alarm Systems

- Smoke detectors (mandatory in large buildings)
- Manual call points (alarm buttons)
- Fire alarm control panels with evacuation alert

Fire Extinguishers

- Portable fire extinguishers in every floor/area
- Type as per risk: CO₂, water, foam, dry powder

Sprinkler Systems

- Required in:
 - Basement areas > 200 m²
 - High-rise residential buildings (>15 m)
 - Hotels, hospitals, malls, office buildings > 500 m²

Wet Risers and Hose Reels

- Required in buildings over 15 m
- Wet riser = vertical pipe with fire hydrants on each floor
- Pressurized by a fire pump

Fire Pumps and Water Storage

- Underground water tank + fire pump
- Tank size depends on building type (e.g. 50,000–2,00,000 liters)
- Diesel pump backup is mandatory

3. Means of Egress (Escape Routes)

Component	NBC Norms
Minimum exits	2 for each floor in buildings >15 m
Corridor width	Minimum 1.5 m (more for assembly/healthcare)
Door width	Min. 1.0 m in public spaces
Exit signage	Illuminated, with arrows and glow-in-the-dark backing
Staircases	Min. 1.5 m width, enclosed and fire-rated
Refuge area	For high-rise buildings: 4% of floor area every 24 m height

4. Fire-Resistant Construction Materials

- **Staircase walls:** 2-hour fire rating
- **Doors to escape routes:** fire-rated (min. 1 hour)
- **Fire separation walls** between occupancy types
- **Use of non-combustible materials** for cladding, partitions

5. Fire Lifts and Access

- Mandatory in buildings >15 m height
- Min. 545 kg capacity; must reach all floors
- Separate from passenger lifts; connected to generator backup
- Fire service access road (minimum 6 m wide) around buildings

6. Clearance and Approvals

- **Fire Safety Plan** must be submitted to local fire department.
- Buildings above a certain size/height need:
 - **Provisional Fire Safety NOC** before construction
 - **Final Fire Safety NOC** before occupancy
- Subject to inspection and re-certification

7. Signage & Training

- **Exit signs** at every corridor junction, stairwell, and door
- **Evacuation plans** displayed on each floor
- **Fire drills** must be conducted regularly in public buildings
- **Staff training** for extinguishers and alarm systems

Fire Norms Based on Height (Simplified Summary)

Building Height ≤ 15 meters

15–24 meters

>24 meters

>45 meters

Key Requirements

Fire extinguishers, basic alarms

Wet risers, hose reels, fire alarms, fire lifts

Sprinklers, refuge areas, pressurized stairwells

Advanced systems: voice evacuation, smoke control, shaft pressurization

Fire Safety Checklist**Item**

- ✓ Fire extinguishers
- ✓ Automatic fire alarm system
- ✓ Sprinkler system
- ✓ Wet riser system
- ✓ Refuge area
- ✓ Fire lift
- ✓ Fire escape staircases
- ✓ Emergency lighting & signs
- ✓ Underground water tank
- ✓ Diesel pump backup

Relevant Codes & References

- NBC 2016 – Part 4: Fire and Life Safety
- IS 2190 – Fire extinguishers
- IS 3844 – Installation of wet riser systems
- IS 15105 – Sprinkler systems
- IS 2189 – Fire detection and alarm systems

State fire department rules – May modify or expand upon NBC