

NABH & FIRE SAFETY

Fires can be devastating, especially in a hospital where a large number of people who need to be evacuated may be vulnerable – immuno compromised, on life support, and incapable of moving on their own. There are special requirements that must be met with while evacuating such people in case of fire emergencies. But before that – **“fires must be prevented”**.

The ‘part 4’ of ‘National Building Code of India – 2005’ on ‘Fire & Life Safety’ covers the requirements for fire prevention & life safety in relation to fire and fire protection of buildings. The Code specifies construction, occupancy and protection features that are necessary to minimize danger to life and property from fire.

Buildings on the basis of occupancies have been divided into different groups in the chapter. Hospitals have been classified as sub-division C-1 under Group C for Institutional Buildings with some specific requirements applicable for this category in addition to the general requirements common for all occupancies.

The NBC gives detailed guidelines for Construction Materials, General Requirements for all buildings, Life Safety, Fire Protection, Specific Occupancy wise Requirements and specific requirements for buildings above 15 meters.

The specific requirements for hospitals, in addition to the general requirements common to all buildings, as per NBC are:

Minimum Requirements for Fire Fighting Installations (NBC)

S.No.	Type of Building/ Occupancy	Type of Installation									Water Supply (In liters)		Pump Capacity (in L/min)	
		Fire Extinguisher	Hose Reel	Dry Riser	Wet Riser	Downcomer	Yard Hydrant	Automatic Sprinkler System	Manually operated Electric Fire Alarm System	Automatic Detection & Fire Alarm System	Underground static water storage tank	Terrace tank	Pump near underground static water storage tank with min pressure 3.5Kg/cm ² at terrace level	At the terrace tank level with min pressure 2 Kg/cm ²
	INSTITUTION BUILDINGS													
a	Hospitals, Sanitoria & Nursing Homes (C-1)													
1	Less than 15 m in height with plot area up to 1000m ²													
i	Up to ground plus one storey, with no beds	R	R	NR	NR	NR	NR	R (NOTE 1)	R	NR	NR	2500 (2500) SEE NOTE 2	NR	NR
ii	Up to ground plus one storey with beds	R	R	NR	NR	R	NR	R (NOTE 1)	R	NR	NR	5000 (5000) SEE NOTE 2	NR	450(450) SEE NOTE 2
iii	Ground plus 2 or more storeys, without beds	R	R	NR	NR	R	NR	R (NOTE 1)	R	R	NR	5000 (5000) SEE NOTE 2	NR	450 (450) SEE NOTE 2

iv	Ground plus 2 or more storeys, with beds	R	R	NR	R	NR	NR	R (NOTE 1)	R	R	50000	5000 (5000) SEE NOTE 2	NOTE 3	NR
2	Less than 15 m in height with plot area more than 1000m ²	R	R	NR	R	NR	R	R (NOTE 1)	R	R	10000	10000	NOTE 3	NR
3	Above 15m height but not exceeding 24m in height	R	R	NR	R	NR	R	R (NOTE 6)	R	R	100000	20000	NOTE 4	NR
4	Above 15m height but not exceeding 30m in height	R	R	NR	R	NR	R	R (NOTE 6)	R	R	150000	20000	NOTE 5	NR
		R = Required			NR = Not required									
	Note 1	Required to be installed in basement if area of basement exceeds 200m ²												
	Note 2	Additional value given in parenthesis shall be added if basement area exceeds 200m ²												
	Note 3	One electric & one diesel pump of capacity 1620 lpm and one electric pump of capacity 180 lpm												
	Note 4	One electric & one diesel pump of capacity 2280 lpm and one electric pump of capacity 180 lpm												
	Note 5	One electric & one diesel pump of capacity 2280 lpm and one electric pump of capacity 180 lpm												
	Note 6	To be installed at all floors at appropriate places and in consultation with local fire authorities												

Exit Facilities:

- In buildings or sections occupied by bed-ridden patients where the floor area is over 280 m², facilities shall be provided to move patients in hospital beds to the other side of a smoke barrier from any part of such building or section not directly served by approved horizontal exits or exits from the first floor (floor 2) of a building to the outside.
- Not less than two exits of one or more of the following types shall be provided for every floor, including basement, of every building or section:
 - a) Doors leading directly outside the building;
 - b) Stairways;

- c) Ramps;
 - d) Horizontal exits; and
 - e) Fire tower.
- All required exits that serve as egress from hospital or infirmary sections shall be not less than 2 m in clear width including patient bedroom doors to permit transportation of patients on beds, litters, or mattresses. The minimum width of corridors serving patients bedrooms in buildings shall be 2400 mm. For detailed information on recommendations for buildings and facilities for the physically handicapped, reference may be made to good practice [4(27)].
 - Elevators constitute a desirable supplementary facility, but are not counted as required exits. Patient lifts shall also be provided with enough room for transporting a stretcher trolley.
 - Any area exceeding 500 m² shall be divided into compartments by fire resistant walls. Doors in fire resistant walls shall be so installed that these may normally be kept in open position, but will close automatically. Corridor door openings in smoke barriers shall be not less than 2000 mm in width. Provision shall also be made for double swing single/double leaf type door.

Additional Precautions:

- No combustible material of any kind shall be stored or used in any building or section thereof used for institutional occupancy, except as necessary to normal occupancy and use of the building.
- Bare minimum quantities of flammable material such as chloroform, ethyl alcohol, spirit, etc shall be allowed to be stored and handled. The handling of such liquids shall not be permitted by un-authorized persons. Bulk storage of these items, will be governed by relevant rules and safe practices.

Exceptions and Deviations:

It is recognized that in institutions or part of buildings housing various types of psychiatric patients, or used as penal and mental institutions, it is necessary to maintain locked doors and barred windows; and to such extent the necessary provision in other sections of the Code requiring the keeping of exits unlocked may be waived. It is also recognized that certain type of psychiatric patients are not capable of seeking safety without adequate guidance. In

buildings where this situation prevails, reliable means for the rapid release of occupants shall be provided, such as remote control of locks, or by keying all locks to keys commonly used by attendants.

Legal Compliance:

It is mandatory for all hospitals to obtain No Objection Certificate from the concerned Fire Department before the building can be occupied.

The NOC is to be renewed every year.

Role of NABH:

NABH is committed to ensuring quality & safety of hospitals and healthcare organizations. The Facility Management & Safety (FMS) Standard covers Fire & other hazards. The standards applicable for fire hazards are:

NABH Standard	NABH objective element	Guidelines for objective elements	Relevance of objective element
FMS. 1: The organization is aware of and complies with the relevant rules and regulations, laws and byelaws and requisite facility inspection requirements	FMS 1a	The management is conversant with the laws and regulations and knows their applicability to the organization.	Legal Compliance
FMS.2: The organization's environment and facilities operate to ensure safety of patients, their families, staff and visitors.	FMS 2b	Drawing related to Fire escape Routes (NBC guidelines)	Infrastructure point of view
FMS.2: The organization's environment and facilities operate to ensure safety of patients, their families, staff and visitors.	FMS 2c	Fire exit signage's (NBC guidelines)	Infrastructure point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Fire exit plan for each floor displayed & in each patient Room (NBC guidelines)	Infrastructure Design point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Exit Door should remain open on all the time (NBC guidelines)	Infrastructure Design point of view

FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Emergency illumination system in case of Fire (NBC guidelines)	Infrastructure Design point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Adequate Fire detection system across Hospital i.e. smoke & Fire sensors (NBC guidelines)	Infrastructure Design point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Adequate Fire Fighting system across Hospital i.e. sprinklers,extinguishers, hydrants (NBC guidelines)	Infrastructure Design point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Central Fire alarm system monitored 24 X 7	Infrastructure Design point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Designated place for assembly of patients/staff in the event of fire	Operational point of view
FMS.2: The organization's environment and facilities operate to ensure safety of patients, their families, staff and visitors.	FMS 2a	Operational & Maintenance plan of Fire equipment including refilling of extinguisher	Hospital Operational point of view
FMS.2: The organization's environment and facilities operate to ensure safety of patients, their families, staff and visitors.	FMS 2a	Up-to-date fire drawing to be available	Hospital Operational point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Deployment of Fire Officer	Hospital Operational point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Adequate training plans for Hospital staff on how to protect patients from fire, how to evacuate patients from fire besides knowing how to report fire, nearest fire escape route, nearest fire extinguisher etc	Hospital Operational point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Schedule to conduct mock fire drills (at least twice in a year)	Hospital Operational point of view
FMS.5: The organization has plans for fire and non-fire emergencies within the facilities.	FMS 5a	Maintenance of mock fire drills records	Hospital Operational point of view

NABH Survey:

During its survey process the NABH auditors look into the following to ensure that the organization is compliant with Fire Safety Regulations:

Fire Prevention and Control Infrastructure:

1. The organization has updated NOC from state Fire Department.
2. The organization has a multi disciplinary safety committee with a senior person as the chairman of the safety committee. The safety committee meetings are held at least once in 3 months. The minutes of the meeting are recorded and put up to the senior management.
3. The organization has a formally appointed Fire Safety Officer in-charge of all concerns related to Fire Prevention & Safety. The Fire Safety Officer should be preferably from Security Staff and should be aware of all fire safety protocols.
4. The organization has a written plan for Fire Prevention and Safety and has a Fire Safety Manual approved by the safety committee.
5. The organization has an Emergency Command Centre that becomes functional immediately whenever there is an emergency. There is a written protocol and written constitution of the committee and the Fire Command Centre is update with the name of the members. A designated person has the responsibility of informing all the Emergency Command members.
6. The Fire Safety Manual has the following components:
 - Plan for fire prevention & control.
 - Systems for fire prevention & control.
 - Maintenance Schedules/ SOPs for systems related to fire prevention & control
 - Inspection protocols for fire safety installations.
 - Codes for announcement of fire related emergency, procedures and communication protocols for the same.

- Responsibilities of different departments in case of fire.
 - Procedures, frequency & protocols for mock drills.
 - Constitution of Fire Fighting & Evacuation Teams.
 - Evacuation Plan.
 - Electrical Safety & System.
7. A multi disciplinary committee, which has Fire Safety Officer as a member, holds facility rounds at least once a year for non-clinical areas & twice a year for clinical areas. Fire Safety requirements are on the checklist of the said committee and the reports are submitted in writing to the safety committee.
 8. The safety committee has a system whereby all fire safety concerns are addressed.
 9. The mock drills are conducted and the reports submitted to the safety committee. Necessary action is taken to address any issues that crop up during mock drills.
 10. The fire exits are well defined and end on the ground floor or refuge area or any safe place decided by the management.
 11. The Fire Signages are appropriate and placed at the right locations.
 12. Emergency fire signages are glow in dark signages.
 13. The Fire Signages are visible and are bilingual, with one local language.
 14. The egress routes are free from any materials that would cause hindrance in evacuation.
 15. The Fire Doors have a proper fire rating and open outside.
 16. The Fire Doors preferably have panic bars.
 17. The Fire Doors remain open at all times.
 18. The Fire cabinets are open all the time.
 19. The Manual Call Points have means to break the glass.

20. The Fire Alarm systems are properly tested and maintained and a record is kept for the same.
21. The Emergency Exit signs should be displayed prominently.
22. The stairwells used for evacuation are pressurized in case of fire emergency.
23. The lifts are not used in case of fire.
24. The HVAC system has appropriate fire dampers to prevent spread of fire that function properly in case of fire. The dampers are tested and have a regular preventive maintenance schedule.
25. All the equipments have an organized preventive maintenance schedule that is recorded and stickers put on the equipments showing the date of preventive maintenance check and the next date for maintenance.
26. Appropriate type & number of fire extinguishers have been installed according to the type of fire that could take place.
27. The Fire Extinguishers have a regular preventive maintenance schedule and stickers are put showing the date of checking and the next scheduled date for checking.
28. 10% of Fire Extinguishers are used every year for checking the same.
29. The building has an approachable peripheral road around it for access by fire brigade.
30. The Fire Pump House is maintained properly and the pumps have pressure gauges that have been calibrated and appropriate pressures are maintained in the fire hydrant & sprinkler lines.
31. There is a proper training program for handling fire emergencies and training records are maintained. The entire staff is imparted fire safety training.
32. The staff is aware of the fire fighting systems, responsibilities during fire emergencies, evacuation routes & techniques, conversant with the type of fire extinguishers and their area of use, trained to operate fire extinguishers, code announcements and assembly points in case of fire.
33. The organization has policies & protocols for storing, dispensing & use of flammable materials. Appropriate warning signs for flammables are displayed.

34. Electrical safeties are in place. Preventive maintenance & testing is done at regular pre decided intervals and are recorded and stickers affixed.
35. All electrical panels have a rubber mat in front of them.
36. The earthing system is tested regularly.
37. The UPS batteries are checked regularly by loading the same periodically to check any heating up etc.
38. There is proper ventilation in panel, UPS & equipment rooms to avoid overheating.
39. There is an approval from the Indian Explosives Department for bulk storage of Diesel & any other flammable material as per Indian Explosives Act, in case stored in bulk.
40. The pumps used for pumping fuel are of flame proof construction.
41. The Provisions are there to take care of fuel overflow.
42. Flues are properly insulated.