NATIONAL BUILDING CODE OF INDIA 2005

BUREAU OF INDIAN STANDARDS

NATIONAL BUILDING CODE OF INDIA

PART 4 FIRE AND LIFE SAFETY

1 SCOPE

This Part 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.

2 TERMINOLOGY

2.0 For the purpose of this Part, the following definitions shall apply.

2.1 Automatic Fire Detection and Alarm System — Fire alarm system comprising components for automatically detecting a fire, initiating an alarm of fire and initiating other actions as appropriate.

NOTE — The system may also include manual fire alarm call points.

2.2 Automatic Sprinkler System — A system of water pipes fitted with sprinkler heads at suitable intervals and heights and designed to actuate automatically, control and extinguish a fire by the discharge of water.

2.3 Building — Any structure for whatsoever purpose and of whatsoever materials constructed and every part thereof whether used as human habitation or not and includes foundation, plinth, walls, floors, roofs, chimneys, plumbing and building services, fixed platforms, *VERANDAH*, balcony, cornice or projection, part of a building or anything affixed thereto or any wall enclosing or intended to enclose any land or space and signs and outdoor display structures. Tents, *SHAMIANAHS*, tarpaulin shelters, etc, erected for temporary and ceremonial occasions with the permission of the Authority shall not be considered as building.

2.4 Building, Height of — The vertical distance measured in the case of flat roofs, from the average level of the ground around and contiguous to the building or as decided by the Authority to the terrace of the last livable floor of the building adjacent to the external wall; and in the case of pitched roofs, up to the point where the external surface of the outer wall intersects the finished surface of the sloping roof; and in the case of gables facing the road, the mid-point between the eaves level and the ridge. Architectural features serving no other function except that of decoration, shall be excluded for the purpose of measuring heights.

2.5 Combustible Material — The material which either burns itself or adds heat to a fire, when tested for non-combustibility in accordance with accepted standard [4(1)].

2.6 Covered Area — Ground area covered by the building immediately above the plinth level. The area covered by the following in the open spaces is excluded from covered area (*see* Table 19):

a) garden, rockery, well and well structures, plant nursery, waterpool, swimming pool (if uncovered), platform round a tree, tank, fountain, bench, *CHABUTARA* with open top and unenclosed on sides by walls and the like;

b) drainage culvert, conduit, catch-pit, gully pit, chamber, gutter and the like;

c) compound wall, gate, unstoreyed porch and portico, slide, swing, uncovered staircases, ramp areas covered by *CHHAJJA* and the like; and

d) watchman's booth, pumphouse, garbage shaft, electric cabin or sub-stations, and such other utility structures meant for the services of the building under consideration.

NOTE — For the purpose of this Part, covered area equals the plot area minus the area due for open spaces in the plot.

2.7 Down-comer — An arrangement of fire fighting within the building by means of down-comer pipe connected to terrace tank through terrace pump, gate valve and non-return valve and having mains not less than 100 mm internal diameter with landing valves on each floor/landing. It is also fitted with inlet connections at ground level for charging with water by pumping from fire service appliances and air release valve at roof level to release trapped air inside.

2.8 Dry Riser — An arrangement of fire fighting within the building by means of vertical rising mains not less than 100 mm internal diameter with landing valves on each floor/landing which is normally dry but is capable of being charged with water usually by pumping from fire service appliances.

2.9 Emergency Lighting — Lighting provided for use when the supply to the normal lighting fails.

2.10 Emergency Lighting System — A complete but discrete emergency lighting installation from the standby power source to the emergency lighting lamp(s), for example, self-contained emergency luminaire or a circuit from central battery generator connected through wiring to several escape luminaries.

2.11 Escape Lighting — That part of emergency lighting which is provided to ensure that the escape route is illuminated at all material times, for example, at all times when persons are on the premises, or at times the main lighting is not available, either for the whole building or for the escape routes.

2.12 Fire Door — A fire-resistive door approved for openings in fire separation.

2.13 Fire Exit — A way out leading to an escape route having panic bar hardware provided on the door.

2.14 Fire Lift — The lift installed to enable fire services personnel to reach different floors with minimum delay, having such features as required in accordance with this Part.

2.15 Fire Load — Calorific energy, of the whole contents contained in a space, including the facings of the walls, partitions, floors and ceilings.

2.16 Fire Load Density — Fire load divided by floor area.

2.17 Fire Resistance Rating — The time that a material or construction will withstand the standard fire exposure as determined by fire test done in accordance with the standard methods of fire tests of materials/structures.

2.18 Fire Resistance — Fire resistance is a property of an element of building construction and is the measure of its ability to satisfy for a stated period some or all of the following criteria:

a) resistance to collapse,

b) resistance to penetration of flame and hot gases, and

c) resistance to temperature rise on the unexposed face up to a maximum of 180°C and/or average temperature of 150°C.

2.19 Fire Separation — The distance in metres measured from the external wall of the building concerned to the external wall of any other building on the site, or from other site, or from the opposite side of street or other public space for the purpose of preventing the spread of fire.

2.20 Fire Separating Wall — The wall provides complete separation of one building from another or part of a building from another or part of a building from another part of the same building to prevent any communication of fire or heat transmission to wall itself which may cause or assist in the combustion of materials on the side opposite to that portion which may be on fire.

2.21 Fire Stop — A fire resistant material, or construction, having a fire resistance rating of not lesss than the fire separating elements, installed in concealed spaces or between structural elements of a building to prevent the spread/propagation of fire and smoke through walls, ceilings and like as per the laid down criteria.

2.22 Fire Tower — An enclosed staircase which can only be approached from the various floors through landings or lobbies separated from both the floor areas and the staircase by fire-resisting doors, and open to the outer air.

2.23 Fire Resisting Wall — A fire resistance rated wall, having protected openings, which restricts the spread of fire and extends continuously from the foundation to at least 1 m above the roof.

2.24 Floor Area Ratio (FAR) — The quotient obtained by dividing the total covered area (plinth area) on all floors by the area of the plot:

$$\text{FAR} = \frac{\text{Total covered area of all floors}}{\text{Plot area}}$$

2.25 High Rise Building — For the purpose of this Part, all buildings 15 m or above in height shall be considered as high rise buildings.

2.26 Horizontal Exit — An arrangement which allows alternative egress from a floor area to another floor at or near the same level in an adjoining building or an adjoining part of the same building with adequate fire separation.

2.27 Means of Egress — A continuous and unobstructed way of travel from any point in a building or structure to a place of comparative safety.

2.28 Occupancy or Use Group — The principal occupancy for which a building or a part of a building is used or intended to be used; for the purpose of classification of a building according to the occupancy, an occupancy shall be deemed to include subsidiary occupancies which are contingent upon it.

2.29 Plinth Area — The built-up covered area measured at the floor level of the basement or of any storey.

2.30 Pressurization — The establishment of a pressure difference across a barrier to protect a stairway, lobby, escape route or room of a building from smoke penetration.

2.31 Pressurization Level — The pressure difference between the pressurized space and the area served by the pressurized escape route, expressed in pascals (Pa).

2.32 Roof Exits — A means of escape on to the roof of a building, where the roof has access to it from the ground. The exit shall have adequate cut-off within the building from staircase below.

2.33 Site Plot — A parcel (piece) of land enclosed by definite boundaries.

2.34 Stack Pressure — Pressure difference caused by a temperature difference creating an air movement within a duct, chimney or enclosure.

2.35 Travel Distance — The distance to be travelled from any point in a building to a protected escape route, external escape route or final exit.

2.36 Ventilation — Supply of outside air into, or the removal of inside air from an enclosed space.

2.37 Venting Fire — The process of inducing heat and smoke to leave a building as quickly as possible by such paths that lateral spread of fire and heat is checked, fire fighting operations are facilitated and minimum fire damage is caused.

2.38 Volume to Plot Area Ratio (VPR) — The ratio of volume of building measured in cubic metres to the area of the plot measured in square metres and expressed in metres.

2.39 Wet Riser — An arrangement for fire fighting within the building by means of vertical rising mains not less than 100 mm nominal diameter with landing valves on each floor/landing for fire fighting purposes and permanently charged with water from a pressurized supply.

NOTE — For definitions of other terms, reference shall be made to good practice [4(2)].

3 FIRE PREVENTION

3.1 Classification of Building Based on Occupancy

3.1.1 *General Classification*

All buildings, whether existing or hereafter erected shall be classified according to the use or the character of occupancy in one of the following groups:

Group A	Residential
Group B	Educational
Group C	Institutional
Group D	Assembly
Group E	Business
Group F	Mercantile
Group G	Industrial
Group H	Storage
Group J	Hazardous

3.1.1.1 Minor occupancy incidental to operations in another type of occupancy shall be considered as part of the main occupancy and shall be classified under the relevant group for the main occupancy.

Examples of buildings in each group are given in **3.1.2** to **3.1.10**.

3.1.2 *Group A Residential Buildings*

These shall include any building in which sleeping accommodation is provided for normal residential purposes with or without cooking or dining or both facilities, except any building classified under Group C.

Buildings and structures under Group A shall be further sub-divided as follows:

Sub-division A-1 Lodging or rooming houses

Sub-division A-2 One or two-family private dwellings

Sub-division A-3 Dormitories

Sub-division A-4 Apartment houses (flats)

Sub-division A-5 Hotels

Sub-division A-6 Hotels (Starred)

a) *Sub-division A-1 Lodging or rooming houses* — These shall include any building or group of buildings under the same management, in which separate sleeping accommodation for a total of not more than 40 persons (beds), on transient or permanent basis, with or without dining facilities but without cooking facilities for individuals is provided. This includes inns, clubs, motels and guest houses.

A lodging or rooming house shall be classified as a dwelling in sub-division A-2 if no room in any of its private dwelling units is rented to more than three persons.

b) *Sub-division A-2 One or two-family private dwellings* — These shall include any private dwelling which is occupied by members of one or two families and has a total sleeping accommodation for not more than 20 persons.

If rooms in a private dwelling are rented to outsiders, these shall be for accommodating not more than three persons per room.

If sleeping accommodation for more than 20 persons is provided in any one residential building, it shall be classified as a building in sub-division A-1, A-3 or A-4 as the case may be.

c) *Sub-division A-3 Dormitories* — These shall include any building in which group sleeping accommodation is provided, with or without dining facilities for persons who are not members of the same family, in one room or a series of closely associated rooms under joint occupancy and single management, for example, school and college dormitories, students, and other hostels and military barracks.

d) *Sub-division A-4 Apartment houses (flats)* — These shall include any building or structure in which living quarters are provided for three or more families, living independently of each other and with independent cooking facilities, for example, apartment houses, mansions and chawls.

e) *Sub-division A-5 Hotels* — These shall include any building or group of buildings under single management, in which sleeping accommodation is provided, with or without dining facilities for hotels classified up to 4 Star Category.

f) *Sub-division A-6 Hotels (starred)* — These shall include the hotels duly approved by the concerned authorities as Five Star and above Hotels.

3.1.3 *Group B Educational Buildings*

These shall include any building used for school, college, other training institutions for day-care purposes involving assembly for instruction, education or recreation for not less than 20 students.

Buildings and structures under Group B shall be further sub-divided as follows:

Sub-division B-1 Schools up to senior secondary level

Sub-division B-2 All others/training institutions

a) *Sub-division B-1 Schools up to senior secondary level* — This sub-division shall include any building or a group of buildings under single management which is used for students not less than 20 in number.

b) *Sub-division B-2 All others/training institutions* — This sub-division shall include any building or a group of buildings under single management which is used for students not less than 100 in number.

In the case of temporary buildings/structures which are utilized for educational purposes, the provisions of **3.2.5.3** shall apply.

If residential accommodation is provided in the schools/institutions, that portion of occupancy shall be classified as a building in sub-division A-3.

3.1.4 *Group C Institutional Buildings*

These shall include any building or part thereof, which is used for purposes, such as medical or other treatment or care of persons suffering from physical or mental illness, disease or infirmity; care of infants, convalescents or aged persons and for penal or correctional detention in which the liberty of the inmates is restricted. Institutional buildings ordinarily provide sleeping accommodation for the occupants.

Buildings and structures under Group C shall be further sub-divided as follows:

Sub-division C-1 Hospitals and sanatoria

Sub-division C-2 Custodial institutions

Sub-division C-3 Penal and mental institutions

a) *Sub-division C-1 Hospitals and sanatoria* — This sub-division shall include any building or a group of buildings under single management, which is used for housing persons suffering from physical limitations because of health or age, for example, hospitals, infirmaries, sanatoria and nursing homes.

b) *Sub-division C-2 Custodial institutions* — This sub-division shall include any building or a group of buildings under single management, which is used for the custody and care of persons, such as children, convalescents and the aged, for example, homes for the aged and infirm, convalescent homes and orphanages.

c) *Sub-division C-3 Penal and mental institutions* — This sub-division shall include any building or a group of buildings under single management, which is used for housing persons under restraint, or who are detained for penal or corrective purposes, in which the liberty of the inmates is restricted, for example, jails, prisons, mental hospitals, mental sanatoria and reformatories.

3.1.5 *Group D Assembly Buildings*

These shall include any building or part of a building, where number of persons not less than 50 congregate or gather for amusement, recreation, social, religious, patriotic, civil, travel and similar purposes, for example, theatres, motion picture houses, assembly halls, auditoria, exhibition halls, museums, skating rinks, gymnasiums, restaurants, places of worship, dance halls, club rooms, passenger stations and terminals of air, surface and marine public transportation services, recreation piers and stadia, etc.

Buildings under Group D shall be further sub-divided as follows:

Sub-division D-1 Buildings having a theatrical or motion picture or any other stage and fixed seats for over 1 000 persons

Sub-division D-2 Buildings having a theatrical or motion picture or any other stage and fixed seats upto 1 000 persons

Sub-division D-3 Buildings without a permanent stage having accommodation for 300 or more persons but no permanent seating arrangement.

Sub-division D-4 Buildings without a permanent stage having accommodation for less than 300 persons with no permanent seating arrangement.

Sub-division D-5 All other structures including temporary structures designed for assembly of people not covered by sub-divisions D-1 to D-4, at ground level.

Sub-division D-6 Buildings having mixed occupancies providing facilities such as shopping, cinema theatres, and restaurants.

Sub-division D-7 All other structures, elevated or underground, for assembly of people not covered by sub-divisions D-1 to D-6.

a) *Sub-division D-1* — This sub-division shall

Table 23 Minimum Requirements for Fire Fighting Installations

(*Clauses* 4.18.2, 6.1.2, 6.2.3, 6.3.2, 6.4.3, 6.5.2, 6.5.2.1, 6.5.2.2, 6.5.2.3, 6.5.2.4, 6.5.2.5, 6.6.2, 6.7.2, 6.8.2 *and* 6.9.2)

Sl No.	Type of Building Occupancy	Type of Installation									Water Supply (in l)		Pump Capacity (in l/min)	
		Fire Extin-gusher	Hose Reel	Dry Riser (*see* Note 6)	Wet Riser	Down-Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electric Fire Alarm Systems	Automatic Detection and Alarm System	Underground Static Water Storage Tank	Terrace Tank	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Terrace Level	At the Terrace Tank Level with Minimum Pressure of 2.0 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
RESIDENTIAL BUILDINGS (A)														
a)	**Lodging or Rooming Houses (A-1)** (*see* Note 1)													
1)	Less than 15 m in height													
	i) Up to 15 rooms	R	NR	NR	NR	NR	NR	R (*see* Note 2)	NR	NR	NR	5 000 (*see* Note 3)	NR	NR
	ii) More than 15 and up to 30 rooms	R	R	NR	NR	NR	NR	R (*see* Note 2)	NR	NR	NR	5 000 (5 000) (*see* Note 4)	NR	450 (450) (*see* Note 4)
	iii) More than 30 rooms	R	R	NR	NR	NR	NR	R (*see* Note 2)	R (*see* Note 5)	NR	NR	10 000 (5 000) (*see* Note 4)	NR	450 (450) (*see* Note 4)
b)	**One or two Family Private Dwellings (A-2)** (*see* Note 1)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Table 23 — *Continued*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
2)	15 m and above but not exceeding 30 m	R	R	NR	R	NR	R	R (*see* Note 10)	R	R	150 000	20 000	(*see* Note 20)	NR
3)	Above 30 m in height	R	R	NR	R	NR	R	R (*see* Note 10)	R	R	200 000	20 000	(*see* Note 21)	NR
e)	**Hotels (A-6)**	R	R	NR	R	NR	R	R (*see* Note 10)	R	R	200 000	20 000	(*see* Note 22)	NR
EDUCATIONAL BUILDINGS (B) (*see* Note 12)														
1)	Less than 15 m in height													
	i) Ground plus one storey	R	NR	NR	NR	NR	NR	R (*see* Note 2)	NR	NR	NR	5 000 (*see* Note 3)	NR	450 (*see* Note 3)
	ii) Ground plus two or more storeys	R	R	NR	NR	NR	NR	R (*see* Note 2)	NR	NR	NR	10 000 (5 000) (*see* Note 4)	NR	450 (450) (*see* Note 4)
2)	15 m and above but not exceeding 30 m in height	R	R	NR	NR	R	NR	R (*see* Note 2)	R	NR	NR	25 000	NR	900
INSTITUTIONAL BUILDINGS (C) (*see* Note 12)														
a)	**Hospitals, Sanatoria and Nursing Homes (C-1)**													
1)	Less than 15 m in height with plot area up to 1 000 m²													
	i) Up to ground plus one storey, with no beds	R	R	NR	NR	NR	NR	R (*see* Note 2)	R	NR	NR	2 500 (2 500) (*see* Note 4)	NR	NR
	ii) Up to ground plus one storey with beds	R	R	NR	NR	R	NR	R (*see* Note 2)	R	NR	NR	5 000 (5 000) (*see* Note 4)	NR	450 (450) (*see* Note 4)
	iii) Ground plus two or more storeys, with no beds	R	R	NR	NR	R	NR	R (*see* Note 2)	R	R	NR	5 000 (5 000) (*see* Note 4)	NR	450 (450) (*see* Note 4)
	iv) Ground plus two or more storeys, with beds	R	R	NR	R	NR	NR	R (*see* Note 2)	R	R	50 000	5 000 (5 000) (*see* Note 4)	(*see* Note 19)	NR