Annexe II
Classification of industries

A. Cottage, Handloom and Household Industries

1. Cosmetic Products
2. Agarbatti
3. Writing Ink
4. Sealing Wax
5. Watch, pen and spectacles repairing
6. Acrylic Sheet Button
7. Plastic Covers (Diary and Files etc.)
8. Knitted Plastic Bags
9. Shoe repairing and manufacturing
10. Rubber stamps
11. Rubber moulded goods
12. Food Products – bakeries etc.
13. Creamery and dairy products
14. Atta Chakki and Masala Grinding
15. Repacking of Medicines etc.
16. Paper Products
17. Card Board Boxes, paper Bag making
18. Book binding
19. Printing Press
20. Ready Made Garments
21. Batik Printing
22. Embroidery
23. Watch Straps (Nylon)
24. Canvas Bags and Products
25. Hosiery Items
26. Surgical Bandages
27. Shoe Laces etc.
28. Thread Reels
29. Tailor labels
30. Mirror and frame making
31. Decorative Glass articles
32. Chalk Sticks
33. Tailor’s Shop
34. Cycle repairing
35. Basket Masking
36. Wire Brushes
37. Umbrella Assembly
38. Wooden Toys
39. Paper pins, Gem clips
40. Hair Pins
41. Wire Staples
42. Wire stands for kitchens

43. Wire for Curtains
44. Wire loops
45. Decorative Key Rings
46. Link Clips
47. File Clips
48. Shoe and Tent Eyelets
49. Brass Jewellary
50. File cover accessories
51. Garment hooks and eyes
52. Link chain
53. Heating element (for domestic electrical appliances)
54. Decoration lighting series
55. Transistor radio Covers
56. Decorative Leather Goods
57. Industrial Leather Hand Gloves
58. Manufacture of Bidi
59. Processing of Supari
60. Laundry, dry cleaning and dyeing
61. Cotton cloth weaving in handlooms
62. Ivory Carving
63. Metal Polishing
64. Gold and silver thread, Zari work, Jewellary, Gold Ornaments
65. Manufacturing, repairing and Tuning of musical instruments
66. Making of lac bangles
67. Repairing of Electronic Instruments
68. Assembly of Furniture Units

B. Light and Service Industries

1. Manufacture of mirror from sheet glass and photo framing
2. Cotton spinning and weaving
3. Automobile servicing and repairs stations
4. Flour mills (including Domestic Atta Chakki)
5. Malted food
6. Food including fruits and vegetable processing
7. Pulping and fermenting of coffee beans
8. Instant tea/coffee, coffee processing
9. Non-alcoholic beverages (soft drinks)
10. Fragrances and industrial perfumes
11. Food additives, nutrients and flavors
12. Fish processing
13. Organic nutrients
14. Surgical and medical products not involving effluent/emission generating processes
15. Laboratory-wares
16. Wire drawing (cold process) and bailing straps

17. Laboratory chemicals involving distillation, purification process
18. Tyres and tubes vulcanisation, vulcanisation, retreading moulding
19. Pesticides/Insecticides/Fungicides/Herbicides/Agrochemical formulation
20. NPK Fertilizers/Granulation
21. Pharmaceuticals formulations
22. Khandsari sugar
23. Pulverizing units
24. Washing of used sand by hydraulic discharge
25. Aatta-chakkies
26. Rice mullors
27. Steeping and processing of grains
28. Mineralised water
29. Dal mills
30. Bakery products, biscuits, confectionery
31. Groundnut decorticating (dry)
32. Supari (Betel nut) and masala grinding
33. Chilling plants and cold storages
34. Ice cream or Ice-making
35. Tailoring and garment making
36. Cotton and woolen hosiery
37. Apparel making
38. Handloom weaving
39. Shoelace manufacturing
40. Gold and silver thread zari work
41. Gems and Jewellary
42. Leather footwear and leather products excluding tanning and hide processing
43. Musical instruments manufacturing
44. Sports goods
45. Bamboo and cane products (only dry operations)
46. Cardboard or corrugated box and paper products (Paper or pulp manufacturing excluded)
47. Insulation and other coated papers (Paper or pulp manufacturing excluded)
48. Scientific and mathematical instruments
49. Furniture (wooden and steel)
50. Assembly of domestic electrical appliances
51. Radio assembling
52. Fountain pens
53. Polythene, plastic and PVC goods through extrusion/moulding
54. Rope (cotton and plastic)
55. Carpet weaving
56. Assembly of air coolers, conditioners
57. Assembly of bicycles, baby carriages and other small non-motorized vehicles
58. Electronics equipment (Assembly)
59. Toys
60. Water softening and de-mineralised plants
61. Paint (by mixing process only)
62. Candles

63. Carpentry (excluding saw mill)
64. Oil ginning/expelling (no hydrogenation/refining)
65. Jobbing and machining
66. Manufacture of steel trunks and suitcases
67. Paper pins and U-clips
68. Block making for printing
69. Optical frames
70. Power looms/handlooms (without dyeing & bleaching)
71. Printing press
72. Garments stitching, tailoring
73. Thermometer making
74. Footwear (rubber)
75. Plastic processed goods
76. Medical and surgical instruments
77. Electronic and electrical goods
78. Rubber goods industry

C. Prohibited Industries

1. Distillery including Fermentation industry
2. Sugar (excluding Khandsari)
3. Fertilizer
4. Chloro alkali
5. Pharmaceuticals (Basic) (excluding formulation)
6. Dyes and Dye-intermediates
7. Pesticides (Technical) (excluding formulation)
8. Tanneries
9. Petrochemicals (Manufacture of and not merely use of as raw material)
10. Cement
11. Thermal power plants
12. Iron and Steel (Involving processing from ore/scrap/Integrated steel plants)
13. Zinc /copper/aluminium smelter
14. Tyres and tubes (excluding Vulcanisation /Retreating/moulding)
15. Synthetic rubber
16. Glass and fiberglass production and processing
17. Industrial carbon including electrodes and graphite blocks, activated carbon, carbon black etc
18. Paints and varnishes (excluding blending/mixing)
19. Pigments and intermediates
20. Synthetic resins
21. Petroleum products involving storage, transfer or processing
22. Lubricating oils, greases or petroleum-based products
23. Synthetic fibers including rayon, tyre cord, polyester filament yarn
24. Surgical and medical products involving prophylactics and latex
25. Synthetic detergent and soap
26. Photographic films and chemicals

27. Chemical, petrochemical and electrochemical including manufacture of acids such as Sulphuric Acid, Nitric Acid, Phosphoric Acid etc
28. Industrial or inorganic gases
29. Chlorates, per chlorates and peroxides
30. Glue and gelatin
31. Yarn and textile processing involving scouring, bleaching, dyeing, printing or any effluent/emission generating process
32. Industry or process involving metal treatment or processes such as pickling, surface coating, paint baking, paint stripping, heat treatment, phosphate or finishing etc
33. Industry or process involving electroplating operations
34. Asbestos and asbestos-based industries
35. Fermentation industry including manufacture of yeast, beer etc
36. Steel and steel products including coke plants involving use of any of the equipments such as blast furnaces, open hearth Furnace, induction furnace or arc furnace etc or any of the operations or processes such as heat treatment, acid pickling, rolling or galvanizing etc
37. Incineration plant
38. Power generating plants (excluding DG Sets)
39. Lime manufacturing
40. Dry coal processing/Mineral processing industries like ore sintering, palletization etc
41. Phosphate rock processing plants
42. Coke making, coal liquefaction, coal tar distillation or fuel gas making
43. Phosphate and detonators, fuses etc.
44. Explosive including detonators, etc
45. Fire crackers
46. Processes involving chlorinated hydrocarbon
47. Chlorine, fluorine, bromine, iodine and their compounds
48. Hydro cyanic acid and its derivatives
49. Milk processing and dairy products (Integrated project)
50. Industry or process involving foundry operations
51. Potable alcohol (IMFL) by blending or distillation of alcohol
52. Anodizing
53. Ceramic/refractoriness
54. Lead processing and battery reconditioning & manufacturing including lead smelting
55. Hot mix plants
56. Mining and ore-beneficiation

For the industries, which do not fall in any of the above-mentioned categories, decision with regard to these to be taken by the Authority.

Annexe III

Fire Protection and Fire Safety Requirements

A.1 SCOPE

This part covers the requirements of the fire protection for the multi-storeyed buildings (high rise buildings) and the buildings, which are of 15 m. and above in height and low occupancies of categories such as Assembly, Institutional., Educational (more than two storeyed and built-up area exceeds 1000 sq m)., Business (where plot area exceeds 500 sq m.), Mercantile (where aggregate covered area exceeds 750 sq m.), Hotel, Hospital, Nursing Homes, Underground Complexes, Industrial Storage, Meeting / Banquet Halls, Hazardous Occupancies.

A.2 PROCEDURE FOR CLEARANCE FROM FIRE SERVICE

a) The concerned Authority shall refer the building plans to the Chief Fire Officer for obtaining clearance in respect of building identified in clause A.1 of these Bye-Laws.

b) The Authority shall furnish three sets of complete building plans along with prescribed fee to the Chief Fire Officer, after ensuring that the proposals are in line with Master Plan/Zonal Plan of the area.

c) The plans shall be clearly marked and indicate the complete fire protection arrangements and the means of access/escape for the proposed building with suitable legend along with standard signs and symbols on the drawings. The same shall be duly signed/certified by a licensed Fire Consultant/Architect.

d) The Chief Fire Officer shall examine these plans to ensure that they are in accordance with the provisions of fire safety and means of escape as per these bye- laws and shall forward two sets of plans duly signed for implementation to the building sanctioning Authority.

e) After completion of fire fighting installations as approved and duly tested and certified by the licensed Fire Consultant / Architect, the Owner/ Builder of the building shall approach the Chief Fire Officer through the concerned Authority for obtaining clearance from fire safety and means of escape point of view. The concerned Authority shall ensure that clearance from Chief Fire Officer has been obtained for the building identified in clause A.1 before granting the completion certificate.

f) On receipt of the above request, the Chief Fire Officer shall issue the No Objection Certificate from fire safety and means of escape point of view after satisfying himself that the entire fire protection measures are implemented and functional as per approved plans.

g) Any deficiencies observed during the course of inspection shall be communicated to the Authority for rectification and a copy of the same shall be forwarded to the concerned building owner /builder.

A.3 RENEWAL OF FIRE CLEARANCE

On the basis of undertaking given by the Fire Consultant / Architect, the Chief Fire Officer shall renew the fire clearance in respect of the following buildings on annual basis:-

1) Public entertainment and assembly

2) Hospitals

3) Hotels

4) Under ground shopping complex

A.4 FEE

a) For augmentation of fire service facilities for effecting rescue/fire fighting operation in high rise building, fee payable to Chief Fire Officer by the applicant(s) along with sets of plans for obtaining the No Objection Certificate shall be as prescribed by the Authority.

A.5 FIRE CONSULTANT

The Architect of the project will be responsible for making provisions for fire protection and fire fighting measure as provided in this Chapter and for that she / he may consult an expert in this field, as in case of other professionals for structural, sanitary and others.

A.6 TERMINOLOGY

For the purpose of this Chapter all the technical terms shall have the meaning as defined in National Building Code of India, Part-IV, Fire Protection as amended from time to time but for the terms which are defined otherwise in these bye-Laws.

A.7 GENERAL

The Chief Fire Officer may insist on suitable provisions in the building from fire safety and means of escape point of view depending on the occupancy, height or on account of new developments creating special fire hazard, in addition to the provision of these building bye laws and part IV (Fire Protection) of National Building Code of India

A.8 MEANS OF ACCESS

No Building shall be erected as to deprive any other building of its means of access.

A.8.1 Every person who erects a building shall not at any time erect or cause or permit to erect or re- erect any building, which in any way encroaches upon or diminishes the area set apart as means of access.

A.8.2 For the multi-storeyed buildings (high rise buildings) and the buildings, which are of 15 m. and above in height and low occupancies of categories such as Assembly, Institutional., Educational (more than two storeyed and built-up area exceeds 1000 sq m)., Business (where plot area exceeds 500 sq m.), Mercantile (where aggregate covered area exceeds 750 sq m.), Hotel, Hospital, Nursing Homes, Underground Complexes, Industrial Storage, Meeting / Banquet Halls, Hazardous Occupancies, the following provisions of means of access shall be applicable.

a) The width of the main street on which the building abuts shall not be less than 12.0 m.
b) If there are any bends or curves in the approach road, sufficient width shall be permitted at the curve to enable the fire tenders to turn, the turning circle shall be at least of 9.0 m. radius.
c) The approach to the building and open spaces on its all sides upto 6.0 m. width and the layout for the same shall be done in consultation with the Chief Fire Officer and the same shall be of hard surface capable of taking the weight of fire tender, weighing upto 22 tones for low rise building and 45 tones for building 15 m., and above in height. The said open space shall be kept free of obstructions and shall be motorable.
d) Main entrance to the premises shall be of adequate width to allow easy access to the fire tender and in no case it shall measure less than 5 m. The entrance gate shall fold back against the compound wall of the premises, thus leaving the exterior access way within the plot free for movement of the fire service vehicles. If-archway is provided over the main entrance, the height of the archway shall not be of height less than 5.0 m.
e) For multi-storeyed group housing schemes on one plot, the approach road shall be 20.0 m. or as per Master Plan/Development Plan provisions and between individual buildings, there shall be 6.0 m. space around.
f) In case of basement extending beyond the building line, it shall be capable of taking load of 45 tones for a building of height 15.0 m. and above and 22 tones for building height less than 15.0 m.

g) The external window shall not be blocked by louvres etc. In such case provisions shall be made so that one can enter the building to be rescued through the window by using hydraulic platform etc.

A.8.3 ***Provisions of Exterior Open Spaces around the Building***

a) The set backs of the respective building shall be as per Master Plan, detailed Layout Plan, general Development Plan.
b) For buildings identified in Building Bye-Laws no. A.9.6 and A.1, the provision of exterior open spaces around the buildings shall be as given in Table below.

Table : Provision of Exterior Open Spaces around the Buildings

Sl. No.	Height of the Building Upto (m.)	Exterior open spaces to be left out on all sides in m. (front rear and sides in each plot)
1	10	As per prescribed set backs
2	15	5
3	18	6
4	21	7
5	24	8
6	27	9
7	30	10
8	35	11
9	40	12
10	45	13
11	50	14
12	55 and above	16

Note:On sides where no habitable rooms face, a minimum space of 9.0 m. shall be left for heights above 27.0 m.

c) In case of multi storeyed buildings the exterior open space around a building shall be of hard surface capable to taking load of fire engine weighting upto 45 tonnes.

A.9 EXIT REQUIREMENT

General

The following general requirement shall apply to exits:

a) Every building meant for human occupancy shall be provided with exits sufficient to permit safe escape of occupants in case of fire or other emergency.
b) In every building exit shall comply with the minimum requirement of this part, except those not accessible for general public use.
c) All exists shall be free of obstructions.
d) No buildings shall be altered so as to reduce the number, width or portion of exits to less than required.
e) Exits shall be clearly visible and the routes to reach exits shall be clearly marked and signs posted to guide the occupants of floor concerned.
f) All exit ways shall be properly illuminated.

g) Fire fighting equipment where provided along exits shall be suitably located and clearly marked but must not obstruct the exit way and there should be clear indication about its location from either side of the exit way.
h) Alarm devices shall be installed to ensure prompt evacuation of the occupants concerned through the exits, wherever required.
i) All exits shall provide continuous means of egress to the exterior of a building or to an exterior open space leading to a street.
j) Exits shall be so arranged that they may be reached without passing through another occupied unit, except in the case of residential buildings.

A.9.1 ***Type of Exits***

a) Exits shall be either horizontal or vertical type. An exit may be doorway, corridor and passage to an internal staircase or external staircase, ramp or to a verandah and/or terraces that have access to the street or to roof of a building. An exit may also include horizontal exit leading to an adjoining building at the same level.
b) Lifts escalators and revolving doors shall not be considered as exits.

A.9.2 ***Number of Size of Exits***

The requisite number and size of various exits shall be provided, based on the occupants in each room and floor based on the occupant load, capacity of exits, travel distance and height of buildings as per provisions of Building Bye-Laws A.9.1.

A.9.3 ***Arrangements of Exits***

a) Exits shall be so located so that the travel distance on the floor shall not exceed 22.50 m. for residential, educational, institutional and hazardous occupancies and 30.0 m. for assembly, business, mercantile, industrial and storage occupancies. Whenever more than one exit is required for a floor of a building they shall be placed as remote from each other as possible. All the exits shall be accessible from the entire floor area at all floor levels.
b) The travel distance to an exit from the remote point shall not exceed half the distance as stated above except in the case of institutional occupancy in which case it shall not exceed 6.0 m.

A.9.4 ***Occupant Load***

Table: Occupant Load

Sl. No.	**Type of Occupancy**	**Occupant Load per 100 sq m. of Plinth or Covered Area**
1	Residential	8.0
2	Educational	25.0
3	Institutional	6.60
4	Assembly (a) with fixed or loose seats and dance floor (b) without seating facilities including dining rooms	 166.6 66.6

Sl. No.	Type of Occupancy	Occupant Load per 100 sq m. of Plinth or Covered Area
5	Mercantile (a) street floor and sales basement (b) upper sale floor	33.3 16.6
6	Business and industrial	10.0
7	Storage	3.3
8	Hazardous	10.0

** The occupant load in dormitory portions of homes for the aged, orphanages or mental hospitals etc. where sleeping accommodation is provided shall be calculated at not less than 13.3 persons per 100 sq.m.*
** The plinth or covered area shall include, in addition to the main assembly room or space, any occupied connecting room or space in the same storey or in the storeys above or below where entrance is common to such rooms and space and the area available for use by the occupants of the assembly place. No deduction shall be made in the plinth/covered area for corridors, closets and other sub-divisions; that area shall include all space serving the particular assembly occupancy.

A.9.5 *Capacity of Exit*

The capacity of exits (staircase, ramps and doorways) indicating the number of which persons could be safety evacuated through a unit exit width of 50 cm shall be as given below:

Table: Occupants per unit Exit width

Sl. No.	Group of Occupancy	Number of Occupants		
		Stairways	Ramps	Doors
1	Residential	25	50	75
2	Educational	25	50	75
3	Institutional	25	50	75
4	Assembly	40	50	60
5	Business	50	60	75
6	Mercantile	50	60	75
7	Industrial	50	60	75
8	Storage	50	60	75
9	Hazardous	25	30	40

A.9.6 *Staircase Requirements*

For buildings as identified in below, there shall be minimum of two staircases and one of them shall be enclosed stairway and the other shall be on the external walls of building and shall open directly to the exterior, interior open space or to any open place of safety. Single staircase may be accepted for educational, business or group housing society where floor area does not exceed 300 sq m. and height of the building does not exceed 24 m. and other requirements of occupant load travel distance and width of staircase shall meet the requirement. The single staircase in such case shall be on the outer wall of the building.

Buildings Identified:
All types of buildings as defined below, except tents, shamianas and tarpaulin shelters erected temporarily for temporary purposes and ceremonial occasions, shall be considered to be "buildings".

a. **"Assembly Building"**- A building or part thereof, where groups of people congregate or gather for amusement, recreation, social, religious, patriotic, civil, travel and similar purposes and this includes buildings of drama and cinemas theatres, drive-in-theatres, assembly halls, city halls, town halls, auditoria, exhibition halls, museums, "mangal karyalayas", skating rinks, gymnasia, restaurants, eating or boarding houses, places of worship, dance halls, clubs, gymkhanas and road, railways, air, sea or other public transportation stations and recreation piers.

b**. "Business Building"-** Includes any building or part thereof used principally for transaction of business and/or keeping of accounts and records including offices, banks, professional establishments, court houses etc., if their principal function is transaction of business and/or keeping of books and records.

c. **"Education Building"**- Includes a building exclusively used for a school or college, recognized by the appropriate Board or University, or any other Competent Authority involving assembly for instruction, education or recreation incidental to educational use, and including a building for such other uses as research institution. It shall also include quarters for essential staff required to reside in the premises, and building used as a hostel captive to an educational institution whether situated in its campus or outside.

d. **"Hazardous Building"-** Includes a building or part thereof used for:
i) Storage, handling, manufacture of processing of radioactive substances or highly combustible or explosive materials or of products which are liable to burn with extreme rapidity and/or producing poisonous fumes or explosive emanations;
ii) Storage, handling, manufacture or processing of which involves highly corrosive, toxic or noxious alkalis, acids, or other liquids, gases or chemicals producing flame, fumes and explosive mixtures etc. or which result in division of matter into fine particles capable of spontaneous ignition.

e. **"Industrial Building"-** Includes a building or part thereof wherein products or material are fabricated, assembled or processed, such as assembly plants, laboratories, power plants, refineries, gas plants, mills, dairies and factories etc.,

f. **"Institutional Building"**- Includes a building constructed by Government, Semi- Government Organizations or Registered Trusts and used for medical or other treatment, or for an auditorium or complex for cultural and allied activities or for an hospice, care of persons suffering from physical or mental illness, handicap, disease or infirmity, care of orphans, abandoned women, children and infants, convalescents, destitute or aged persons and for penal or correctional detention with restricted liberty of the inmates ordinarily providing sleeping accommodation and includes dharamshalas, hospitals, sanatoria, custodial and penal institutions such as jails, prisons, mental hospitals, houses of correction, detention and reformatories etc.,

g. **"Mercantile Building"-** Includes a building or part thereof used as shops, stores or markets for display and sale of wholesale and or retail goods or merchandise, including office, storage and service facilities incidental thereto and located in the same building.

h**. "Multi-Storeyed Building or High Rise Building"-** A building above 4 stories, and/or a building exceeding 15 meters or more in height above the average level of front road.

i. **"Multi Level Car Parking Building"-** A building partly below ground level having two or more basements or above ground level, primarily to be used for parking of cars, scooters or any other type of light motorized vehicle.

j**. "Office Building (premises)"-** includes a building or premises or part thereof whose sole or principal use is for an office or for officer purposes or clerical work. "Officer purposes" include the purpose of administration, clerical work, handling money, telephone, telegraph and computer operation; and "clerical work" includes writing, book -keeping, sorting papers, typing, filling, duplicating, punching cards or tapes, machine calculations, drawing of matter for publication and editorial preparation of matter for publication.

k. **"Special Building"-** Includes assembly, industrial, hazardous buildings, buildings used for wholesale establishments, hotels, hostels, centrally air conditioned buildings and which exceed 15 meters in height and have a total built up area exceeding 600 sq m.

l. **"Storage Building"-** A building or part thereof used primarily for storage or shelter of goods, wares, merchandise and includes a building used as a warehouse, cold storage, freight depot, transit shed, store house, public garage, hanger, truck terminal, grain elevator, barn and stables.

m. **"Wholesale Establishment"-** An establishment wholly or partly engaged in wholesale trade and manufacture, wholesale outlets, including related storage facilities, warehouses and establishments engaged in truck transport, including truck transport booking agencies.

A.9.7 *Minimum Width Provision for Stairways*

The following minimum width provisions shall be made for each stairway

a) i) Residential low rise building - 0.9 m.
   ii) Other residential building e.g. flats, hostels, group housing, guest houses, etc - 1.25 m.
b) Assembly buildings like Auditorium, theatres and cinemas - 2.0 m.
c) All other buildings including hotels - 1.5 m.
d) Institutional building like hospitals - 2.0 m.
e) Educational building like School, Colleges. - 1.5 m.

A.9.8 *Minimum Width Provision for Passageway/Corridors*

The following minimum width provisions shall be made for each passage way/corridor.

a) Residential buildings, dwelling unit type		1.0 m.
b) Residential buildings, e.g., hostels, etc.		1.25 m.
c) Assembly buildings like auditorium theatres and cinemas	2.0 m.	
d) All other buildings including hotels	1.5 m.	
e) Hospital, Nursing Homes, etc.		2.4 m.

A.9.9 *Doorways*

a) Every doorway shall open into an enclosed stairway, a horizontal exit, on a corridor or passageway providing continuous and protected means of egress.

b) No exit doorways shall be less than l00 cm in width and 150 cm in case of hospital and ward block. Doorways shall not be less than 200 cm in height.

c) Exit doorways shall open outwards, that is away front the room but shall not obstruct the travel along any exit. No door when opened shall reduce the required width of stairway or landing to less than 100 cm. Overhead or sliding door shall not be installed.

d) Exit door shall not open immediately upon a flight or stairs. A landing equal to at least, the width of the door shall be provided in the stairway at each doorway. Level of landings shall be the same as that of the floor, which it serves.

e) Exit doorways shall be openable from the side, which they serve without the use of a key.

f) Revolving doors shall not be allowed.

A.9.10 ***Stairways***

a) Interior stairs shall be constructed of non-combustible material throughout.

b) Interior stairs shall be constructed as a self-contained unit with atleast one side adjacent to an external wall and shall be completely enclosed.

c) A staircase shall not be arranged round a lift shaft for buildings 15.0 m. and above height. The staircase location shall be to the satisfaction of Chief Fire Officer.

d) Hollow combustible construction shall not be permitted.

e) The minimum width of internal staircase shall be as given in bye-law 4.8.6.

f) The minimum width of treads without nosing shall be 25 cm. for an internal staircase for residential high-rise buildings. In the case of other buildings, the minimum tread shall be 30 cm. The treads shall be constructed and maintained in a manner to prevent slipping. Winders shall be allowed in residential buildings provided they are not at the head of a downward flight.

g) The maximum height of riser shall be 19 cm. in the case of residential high rise buildings and 15 cm in the case of other buildings They shall be limited to 12 per flight.

h) Handrails shall be provided with a minimum height of 100 cm. from the center of the tread.

i) The minimum headroom in a passage under the landing of a staircase and under the staircase shall be 2.2 m.

j) For building more than 24 m. in height, access to main staircase shall be through a lobby created by double door of one hour fire rating. One of the doors will be fixed in the wall of the staircase and other after the lobby.

k) No living space, store or other fire risk shall open directly into the staircase or staircases.

l) External exit door of staircase enclosure at ground level shall open directly to the open spaces or can be reached without passing through any door other than a door provided to form a draught lobby.

m) The main staircase and fire escape staircase shall be continuous from ground floor to the terrace level.

n) No electrical shafts/AC ducts or gas pipe etc. shall pass through the staircase. Lift shall not open in staircase landing.

o) No combustible material shall be used for decoration/wall paneling in the staircase.

p) Beams/columns and other building features shall not reduce the head room/width of the staircase.

q) The exit sign with arrow indicating the way to the escape route shall be provided at a suitable height from the floor level on the wall and shall be illuminated by electric light connected to corridor circuits. All exit way marking sign should be flush with the wall and so designed that no mechanical damage shall occur to them due to moving of furniture or other heavy equipments. Further all landings of floor shall have floor-indicating boards indicating the number of floor as per bye-law.

The floor indication board shall be placed on the wall immediately facing the flight of stairs and nearest to the landing. It shall be of size not less than 0.2 m. x 0.5 m.

r) Individual floors shall be prominently indicated on the wall facing the staircase.

s) In case of single staircase it shall terminate at the ground floor level and the access to the basement shall be by a separate staircase. However, the second staircase may lead to basement levels provided the same is

separated at ground level either by ventilated lobby with discharge points at two different ends through enclosures.

A.9.11 ***Fire Escapes or External Stairs:***

a) Fire escape shall not be taken into account while calculating the number of staircases for a building.

b) All fire escapes shall be directly connected to the ground.

c) Entrance to the fire escape shall be separate and remote from internal staircase.

d) The route to fire escape shall be free of obstructions at all times except the doorway leading to the fire escape which shall have the required fire resistance.

e) Fire escape shall be constructed of non-combustible materials.

Fire escape stairs shall have straight flight not less than 125 cm wide with 25 cm treads and risers not more than 19 cm.

Handrails shall be at a height not less than 100 cm.

h) Fire escape staircase in the mercantile, business, assembly, hotel buildings above 24 m. height shall be a fire tower and in such a case width of the same shall not be less than the width of the main staircase. No combustible material shall be allowed in the fire tower.

A.9.12 Spiral Stairs

a) The use of spiral staircase shall be limited to low occupant load and to a building height 9 m.

b) A spiral stair shall not be less than 150 cm in diameter and shall be designed to give the adequate headroom.

A.9.13 Staircase Enclosures

a) The external enclosing walls of the staircase shall be of the brick or the R.C.C. construction having fire resistance of not less than two hours. All enclosed staircases shall have access through self-closing door of one-hour fire resistance. These shall be single swing doors opening in the direction of the escape. The door shall be fitted with the check action door closers.

b) The staircase enclosures on the external wall of the building shall be ventilated to the atmosphere at each landing.

c) Permanent vent at the top equal to the 5% of the cross sectional area of the enclosure and openable sashes at each floor level with area equal to 1 to 15% of the cross sectional area of the enclosure on external shall be provided. The roof of the shaft shall be at least 1 m. above the surrounding roof. There shall be no glazing or the glass bricks in any internal closing wall of staircase. If the staircase is in the core of the building and cannot be ventilated at each landing, a positive of 5-mm. w.g. by an electrically operated blower/blowers shall be maintained.

d) The mechanism for pressurizing the staircase shaft shall be so installed that the same shall operate automatically on fire alarm system/sprinkler system and be provided with manual operation facilities.

A.9.14 Ramps

a) Ramps of slope of not more than 1 in 10 may be substituted for and shall comply with all the applicable requirements of all required stairways as to enclosure capacity and limiting dimensions. Larger slopes shall

be provided for special uses but in no case greater than 1 in 8. For all slopes exceeding 1 in 10 and where the use is such as to involve danger of slipping, the ramp shall be surfaced with approved non-slipping material.

b) The minimum width of the ramps in the Hospitals shall be 2.4 m. and in the basement using car parking shall be 6.0 m.

c) Handrails shall be provided on both sides of the ramp.

d) Ramp shall lead directly to outside open space at ground level or courtyards of safe place.

e) For building above 24.0 m. in height, access to ramps from any floor of the building shall be through smoke fire check door.

f) In case of nursing homes, hospitals etc. area exceeding 300 sq m. at each floor one of the exit facility shall be a ramp of not less than 2.4 m. in width.

A.10 PROVISION OF LIFTS

a) Provision of the lifts shall be made for all multi-storeyed building having a height of 15.0 m. and above.

b) All the floors shall be accessible for 24 hrs. by the lift. The lift provided in the buildings shall not be considered as a means of escape in case of emergency.

c) Grounding switch at ground floor level to enable the fire service to ground the lift car in case of emergency shall also be provided.

d) The lift machine room shall be separate and no other machinery be installed in it.

A.10.1 Lift Enclosure/lift

General requirements shall be as follows

a) Walls of lift enclosures shall have a fire rating of two hours. Lift shafts shall have a vent at the top of area not less than 0.2 sq m.

b) Lift motor room shall be located preferably on top of the shaft and separated from the shaft by the floor of the room.

c) Landing door in lift enclosures shall have a fire resistance of not less than one hour.

d) The number of lifts in one lift bank shall not exceed four. A wall of two hours fire rating shall separate individual shafts in a bank.

e) Lift car door shall have a fire resistance rating of 1 hour.

f) For buildings 15.0 m. and above in height, collapsible gates shall not be permitted for lifts and solid doors with fire resistance of at least one hour shall be provided.

g) If the lift shaft and lobby is in the core of the building a positive pressure between 25 and 30 pa shall be maintained in the lobby and a possible pressure of 50 pa shall be maintained in the lift shaft. The mechanism for the pressurization shall act automatically with the fire alarm/sprinkler system and it shall be possible to operate this mechanically also.

h) Exit from the lift lobby, if located in the core of the building, shall be through a self-closing fire smoke check door of one-hour fire resistance.

i) Lift shall not normally communicate with the basement. If however, lifts are in communication, the lift lobby of the basement shall be pressurized as in (g) with self closing door as in (h).

j) Grounding switch (es), at ground floor level shall be provided to enable the fire service to ground the lifts.

k) Telephone/talk back communication facilities may be provided in lift cars for communication system and lifts shall be connected to the fire control room of the building.

l) Suitable arrangements such as providing slope in the floor of the lift lobby shall be made to prevent water used during fire fighting, etc at any landing from entering the lift shafts.

m) A sign shall be posted and maintained on every floor at or near the lift indicating that in case of fire, occupants shall use the stairs unless instructed otherwise. The sign shall also contain a plan for each floor showing the location of the stairways. Floor marking shall be done at each floor on the wall in front of the lift-landing door.

n) Alternate power supply shall be provided in all the lifts.

A.10.2 Fire Lift

Following details shall apply for a fire lift in addition to above requirements:

a) To enable fire service personnel to reach the upper floors with the minimum delay, one or more of the lifts shall be so designed so as to be available for the exclusive use of the fireman in an emergency and be directly accessible to every dwelling/lettable floor space on each floor.

b) The lift shall have a floor area of not less than 1.4 sq.mt. It shall have a loading capacity of not less than 545 kg. (8 persons lift) with automatic closing doors.

c) The electric supply shall be on a separate service from electric supply mains in a building and the cables run in a route safe from fire, that is within a lift shaft. Lights and fans in the elevator having wooden paneling or sheet steel construction shall be operated on 24-volt supply.

d) In case of failure of normal electric supply, it shall automatically switchover to the alternate supply. For apartment houses, this changeover of supply could be done through manually operated changeover switch. Alternatively, the lift should be so wired that in case of power failure, it comes down at the ground level and comes to stand still with door open.

e) The operation of a fire lift shall by a single toggle of two-button switch situated in a glass-fronted box adjacent to the lift at the entrance level. When the switch is on landing; call points will become inoperative and the lift will be on car control only or on a priority control device. When the switch is off, the lift will return to normal working. This lift can be used by the occupants in normal times.

f) The words 'F1RE LIFT' shall be conspicuously displayed in fluorescent paint on the lift landing doors at each floor level.

g) The speed of the fire lift shall be such that it can reach to the top floor from ground level within one minute.

A.11 BASEMENT

A.11.1 Requirements

i) The access to the basement shall be either from the main or alternate staircase providing access and exit from higher floors. Where the staircase is continue the same shall be enclosed type serving as a fire separation from the basement floor and higher floors. Open ramps shall be permitted if they are constructed within the building line subject to the provision of the (iv).

ii) In case of basement for office, sufficient number of exit ways and access ways shall be provided with a travel distance not more than 15.0 m. The travel distance in case of dead-end shall be 7.5 m.

iii) The basement shall be partitioned and in no case compartment shall be more than 500 sq m. and less than 50 sq m. area except parking. Each compartment shall have ventilation standards as laid down in Bye-Laws separately and independently. The partition shall be made in consultation with Chief Fire Officer.

iv) The first basement (immediately below ground level) can be used for services/parking/other permissible services. Lower basement, if provided, shall exclusively be used for car parking only.

v) Each basement shall be separately ventilated. Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement shall be provided in the form of grills or breakable starboard lights or pavement lights or by way of shafts. Alternatively a system of air inlets shall be provided at basement floor level and smoke outlets at basement ceiling level. Inlets and extracts may be terminated at ground level with starboard or pavement lights as before. But ducts to convey fresh air to the basement floor level have to be laid. Starboard and pavement lights should be in positions easily accessible to the firemen and clearly marked "SMOKE OUTLET" or AIR INLET" with an indication of area served at or near the opening.

vi) The staircase of basement shall be of enclosed type having fire resistance of not less than two hours and shall be situated at the periphery of the basement to be entered at ground level only from the open air and in such positions that smoke from any fire in the basement shall not obstruct any exit serving the ground and upper stories of the building and shall communicate with basement through a lobby provided with fire resisting self closing door of one hour rating. In case of basement being used as car parking only, the travel distance shall be 45 m.

vii) In multi-storeyed basements, intake duct may serve all basements levels, but each basement and basement compartment shall have separate smoke outlet duct or ducts. Mechanical extractors for smoke venting system from lower basement levels shall also be provided. The system shall be of such design as to operate on actuation of smoke, heat sensitive detectors/sprinklers, if installed, and shall have a considerably superior performance compared to the standard units. It shall also have an arrangement to start it manually.

viii) Mechanical extractors shall have an internal locking arrangement so that extractors shall continue to operate and supply fans shall stop automatically with the actuation of fire detectors. Mechanical extractors shall be designed to permit 30 air changes per hour in case of fire or distress call. However, for normal operation, only 30 air changes or any other convenient factor can be maintained.

ix) Mechanical extractors shall have an alternate source of power supply.

x) Ventilating ducts shall be integrated with the structure and made out of brick masonry or RCC as far as possible and when this duct crosses the transformer area of electrical switchboard, fire dampers shall be provided.

xi) Kitchens working on gas fuel shall not be permitted in basement/sub-basement.

xii) If cutouts are provided from basement to the upper floors or to the atmosphere, all side cutout openings in the basements shall be protected by sprinkler heads at closed spacing so as to form a water curtain in the event of a fire.

xiii) Dewatering pump shall be provided in all basements.

A.12 PROVISION OF HELIPAD

All high-rise buildings 50 m. and above shall have provision for a Helipad on the terrace. The same shall be approved by the Authority.

A.13 SERVICE DUCTS/REFUGE CHUTE

a) Service duct shall be enclosed by walls and door, if any, of 2 hours fire rating. If ducts are larger than 10 sq m. the floor should seal them, but provide suitable opening for the pipes to pass through, with the gaps sealed.

b) A vent opening at the top of the service shaft shall be provided between one-fourth and one-half of the area of the shaft. Refuge chutes shall have an outlet at least of wall of non-combustible material with fire resistance of not less than two hours. They shall not be located within the staircase enclosure or service

shafts or air-conditioning shafts. Inspection panel and door shall be tight fitting with 1 hour fire resistance; the chutes should be as far away as possible form exits.

c) Refuge chutes shall not be provided in staircase walls and A/C shafts etc.

A.14 ELECTRICAL SERVICES

Electrical Services shall conform to the following:

a) The electric distribution cables/wiring shall be laid in a separate duct shall be sealed at every floor with non-combustible material having the same fire resistance as that of the duct. Low and medium voltage wiring running in shaft and in false ceiling shall run in separate conduits.

b) Water mains, telephone wires, inter-com lines, gas pipes or any other service lines shall not be laid in ducts for electric cables.

c) Separate conduits for water pumps, lifts, staircases and corridor lighting and blowers for pressuring system shall be directly from the main switch panel and these circuits shall be laid in separate conduit pipes, so that fire in one circuit will not affect the others. Master switches controlling essential service circuits shall be clearly labeled.

d) The inspection panel doors and any other opening in the shaft shall be provided with airtight fire doors having fire resistance of not less then 1 hour.

e) Medium and low voltage wiring running in shafts, and within false ceiling shall run in metal conduits. Any 230 voltage wiring for lighting or other services, above false ceiling should have 660V grade insulation. The false ceiling including all fixtures used for its suspension shall be of non-combustible material.

f) An independent and well-ventilated service room shall be provided on the ground floor with direct access from outside or from the corridor for the purpose of termination of electrical supply from the licenses service and alternative supply cables. The doors provided for the service room shall have fire resistance of not less than 1 hour

g) MCB and ELCB shall be provided for electrical circuit.

A.15 STAIRCASE AND CORRIDOR LIGHTS

The staircase and corridor lighting shall be on separate circuits and shall be independently connected so that it could be operated by one switch installation on the ground floor easily accessible to fire fighting staff at any time irrespective of the position of the individual control of the light points, if any. It should be of miniature circuit breaker type of switch so as to avoid replacement of fuse in case of crisis.

a) Staircase and corridor lighting shall also be connected to alternate source of power supply.

b) Suitable arrangement shall be made by installing double throw switches to ensure that the lighting installed in the staircase and the corridor does not get connected to two sources of supply simultaneously. Double throw switch shall be installed in the service room for terminating the stand by supply.

c) Emergency lights shall be provided in the staircase and corridor.

A.16 AIR-CONDITIONING

a) Air- conditioning system should be installed and maintained so as to minimise the danger of spread of fire, smoke or fumes thereby from one floor of fire area to another or from outside into any occupied building or structure.

b) Air -Conditioning systems circulating air to more than one floor area should be provided with dampers designed to close automatically in case of fire and thereby prevent spread of fire or smoke. Such a system should also be provided with automatic controls to stop fans in case of fire, unless arranged to remove smoke from a fire, in which case these should be designed to remain in operation.

c) Air- conditioning system serving large places of assembly (over one thousand persons), large departmental stores, or hostels with over 100 rooms in a single block should be provided with effective means for preventing circulation of smoke through the system in the case of fire in air filters or from other sources drawn into the system even though there is insufficient heat to actuate heat smoke sensitive devices controlling fans or dampers. Such means shall consist of approved effective smoke sensitive controls.

A.16.1 Air- Conditioning should conform to the following:

a) Escape routes like staircase, common corridors, lift lobbies; etc should not be used as return air passage.

b) The ducting should be constructed of metal in accordance with BIS 655:1963

c) Wherever the ducts pass through fire walls or floor, the opening around the ducts should be sealed with fire resisting material of same rating as of walls / floors.

d) Metallic ducts should be used even for the return air instead of space above the false ceiling.

e) The material used for insulating the duct system (inside or outside) should be of flame resistant (IS 4355: 1977) and non- conductor of heat.

f) Area more than 750 sq m. on individual floor should be segregated by a firewall and automatic fire dampers for isolation should be provided.

g) In case of more than one floor, arrangement by way of automatic fire dampers for isolating the ducting at every floor from the floor should be made. Where plenums used for return air passage, ceiling and its features and air filters of the air handling units, these should be flame resistant. Inspection panels should be provided in the main trenching. No combustible material should be fixed nearer than 15 cm. to any duct unless such ducting is properly enclosed and protected with flame resistant material

h) In case of buildings more than 24 m. in height, in non-ventilated lobbies, corridors, smoke extraction shaft should be provided.

A.16.2 Fire Dampers

a) These shall be located in air ducts and return air ducts/passages at the following points:

i) At the fire separation wall.

ii) Where ducts/passages enter the central vertical shaft.

iii) Where the ducts pass through floors.

iv) At the inlet of supply air duct and the return air duct of each compartment on every floor.

b) The dampers shall operate automatically and shall simultaneously switch off the air- handling fans. Manual operation facilities shall also be provided.

Note: For blowers, where extraction system and dust accumulators are used, dampers shall be provided.

c) Fire/smoke dampers(for smoke extraction shafts) for building more than 24 m. in height.

For apartment houses in non-ventilated lobbies /corridor operated by detection system and manual control sprinkler system.

For other buildings on operation of smoke/ heat detection system and manual control/sprinkler system.

d) Automatic fire dampers shall be so arranged so as to close by gravity in the direction of air movement and to remain tightly closed on operation of a fusible link.

A.17 BOILER ROOM

Provisions of boiler and boiler rooms shall conform to Indian Boiler Act. Further, the following additional aspects may be taken into account in the location of boiler/ boiler room

a) The boiler shall not be allowed in sub-basement, but may be allowed in the basement away from the escape routes.

b) The boilers shall be installed in a fire resisting room of 4 hours fire resistance rating, and this room shall be situated on the periphery of the basement. Catch pits shall be provided at the low level.

c) Entry to this room shall be provided with a composite door of 2 hours fire resistance.

d) The boiler room shall be provided with fresh air inlets and smoke exhaust directly to the atmosphere.

e) The furnace oil tank for the boiler if located in the adjoining room shall be separated by fire resisting wall of 4 hours rating. The entrance to this room shall be provided with double composite doors. A curb of suitable height shall be provided at the entrance in order to prevent the flow of oil into boiler room in case of tank rupture.

f) Foam inlets shall be provided on the external walls of the building near the ground level to enable the fire services to use foam in case of fire.

A.18 ALTERNATE SOURCE OF ELECTRIC SUPPLY

A stand by electric generator shall be installed to supply power to staircase and corridor lighting circuits, lifts detection system, fire pumps, pressurization fans and bowlers, P..A system, exit sign, smoke extraction system, in case of failure of normal electric supply. The generator shall be capable of taking starting current of all the machines and circuits stated above simultaneously.

If the standby pump is driven by diesel engine, the generator supply need not be connected to the standby pump. The generator shall be automatic in operation.

A.19 SAFETY MEASURES IN ELECTRIC SUB-STATION

1) Clear independent approach to the sub-station from outside the building shall be made available round the clock

2) The approaches/corridors to the sub-station area shall be kept clear for movement of men and material at all times.

3) The sub-station space is required to be provided with proper internal lighting arrangements.

4) In addition to natural ventilation proper ventilation to the sub-station area is to be provided by grill shutters and exhaust fans at suitable places so as to discharge all smoke from the sub-station without delay in case of fire so that sub-station operations can be carried out expeditiously.

5) Cable trenches of 0.6 m. X 0.6 m. dummy floor of 0.6 mt. depth shall be provided to facilitate laying of cable inside the building for connecting to the equipment.

6) Steel shutters of 8'X 8' with suitable grills shall be provided for transformers and sub-station room.

7) The floor of the sub-station should be capable of carrying 10 tons of transformer weight on wheels.

8) Built up substation space is to be provided free of cost.

9) Sub-station space should be clear from any water, sewer, air conditioning, and gas pipe or telephone services. No other service should pass through the sub station space or the cable trenches.

10) Proper ramp with suitable slope may be provided for loading and unloading of the equipment and proper approach will be provided.

11) RCC pipes at suitable places as required will be provided for the cable entries to the sub station space and making suitable arrangement for non-ingress of water through these pipes.

12) The sub station space is to be provided in the approved/sanctioned covered area of the building.

13) Any other alteration /modification required while erection of the equipment will be made by the Owner / builder at site as per requirement.

14) Adequate arrangement for fixing chain pulley block above the fixing be available for load of 15 tons.

15) Provision shall be kept for the sumps so as to accommodate complete volume of transformer oil, which can spillover in the event of explosion of the transformer in the basement of the building. Sufficient arrangement should exist to avoid fire in the sub-station building from spread of the oil from the sumps.

16) Arrangement should be made for the provision of fire retardent cables so as to avoid chances of spread of fire in the sub-station building.

17) Sufficient pumping arrangement should exist for pumping the water out, in case of fire so as to ensure minimum loss to the switchgear and transformer.

18) No combustible material should be stacked inside the substation premises or in the vicinity to avoid chances of fire.

19) It should be made mandatory that the promoters of the multi-storeyed building should get substation premises inspected once a year to get their license revalidated for the provision of electric supply from Electricity Board so that suitable action can be taken against the Owner / Builder in case of non-implementation of Bye-Laws.

20) The sub-station must not be located below the 1st basement and above the ground floor.

21) The sub station space should be totally segregated from the other areas of the basement by fire resisting wall. The ramp should have a slope of 1 : 10 with entry from ground level. The entire Sub-station space including the entrance at ground floor be handed over to the licensee of electricity free of cost and rent.

22) The sub-station area shall have a clear height of 12 feet (3.65 m.) below beams. Further the Sub-station area will have level above the rest of basement level by 2 feet.

23) It is to be ensured that the Sub-station area is free of seepage / leakage of water.

24) The licensee of electricity will have the power to disconnect the supply of the building in case of violation of any of the above points.

25) Electric sub station enclosure must be completely segregated with 4-hours fire rating wall from remaining part of basement.

26) The Sub-station should be located on periphery /sub basement and (not above ground floor).

27) Additional exit shall be provided if travel distance from farthest corner to ramp is more than l5 m.

28) Perfect independent vent system 30 air changes per hour linked with detection as well as automatic high velocity water spray system shall be provided.

29) All the transformers shall be protected with high velocity water spray system / Nitrogen Injection System Carbon Dioxide total flooding system in case of oil filled transformer. In addition to this, manual control of auto high velocity spray system for individual transformers shall be located outside the building at ground floor.

30) Suitable arrangement for pump house, water storage tanks with main electrical pump and a diesel-operated pump shall be made if no such arrangement is provided in the building. In case the water pumping facilities are existing in the building for sprinkler system, the same should however be utilized for high velocity water spray system. Alternatively automatic CO2 total flooding system shall be provided with manual controls outside the electric sub-station.

31) System shall have facility to give an audio alarm in the basement as well as at the control room.

32) Fire control room shall be manned round the clock.

33) The electric sub station shall have electric supply from alternate source for operation of vent System lighting arrangements.

34) Cable trenches shall be filled with sand

35) Party walls shall be provided between two transformers as per the rules.

36) Electric control panels shall be segregated.

37) Exits from basement electric substation shall have self-closing fire smoke check doors of 2-hours fire rating near entry to ramp.

38) All openings to lower basement or to ground floor shall be sealed properly.

39) Yearly inspection shall be carried out by electrical load sanctioning Authority.

40) Ramp to be designed in a manner that in case of fire no smoke should enter the main building.

41) Electric sub station transformer shall have clearance on all sides as per BBL/relevant electric rules.

42) Other facility will be as per Building Bye-Laws and relevant electric rules.

43) Rising electrical mains shall consist of metal bus bars suitably protected from safety point of view.

44) Oil less transformer shall be preferred.

A.20 FIRE PROTECTION REQUIREMENTS

Buildings shall be planned, designed and constructed to ensure fire safety and this sha1l be done in accordance with part IV Fire Protection of National Building Code of India, unless otherwise specified in these Bye-Laws.

A.20.1 First Aid /Fixed Fire Fighting /Fire Detection Systems and other Facilities

Provision of fire safety arrangement for different occupancy shall be as below**.**

1. Access
2. Wet Riser
3. Down Comer
4. Hose Reel
5. Automatic Sprinkler System

6. Yard Hydrant
7. U.G. Tank with Draw off Connection
8. Terrace Tanks
9. Fire Pump
10. Terrace Pump
11. First Aid Fire Fighting Appliances
12. Auto Detection System
13. Manual operated Electrical Fire Alarm System
14. P.A System with talk back facility
15. Emergency Light
16. Auto D.G. Set
17. Illuminated Exit Sign
18. Means of Escape
19. Compartimentation
20. MCB /ELCB
21. Fire Man Switch in Lift
22. Hose Boxes with Delivery Hoses and Branch
23. Pipes Refuge Area

Note

1) Where more than one riser is required because of large floor area, the quantity of water and pump capacity recommended should be finalized in consultation with Chief Fire Officer.

2)The above quantities of water shall be exclusively for fire fighting and shall not be utilized for domestic or other use.

3) A facility to boost up water pressure in the riser directly from the mobile pump shall be provided in the wet riser, down comer system with suitable fire service inlets (collecting head) with 2 to 4 numbers of 63 mm inlets for 100-200 mm dia main, with check valve and a gate valve.

4) Internal diameter of rubber hose for reel shall be minimum 20 mm. A shut off branch with nozzle of 5 mm. size shall be provided.

5) Fire pumps shall have positive suctions. The pump house shall be adequately ventilated by using normal/mechanical means. A clear space of 1.0 m. shall be kept in between the pumps and enclosure for easy movement /maintenance. Proper testing facilities and control panel etc. shall be provided.

6) Unless otherwise specified in Bye-Laws, the fire fighting equipments /installation shall conform to relevant Indian Standard Specification.

7) In case of mixed occupancy, the fire fighting arrangement shall be made as per the highest class of occupancy.

8) Requirement of water based first aid fire extinguishers shall be reduced to half if hose reel is provided in the Building.

A.21 STATIC WATER STORAGE TANK

a) A satisfactory supply of water exclusively for the purpose of fire fighting shall always be available in the form of underground static storage tank with capacity specified in Annexure-A with arrangements of replenishment by town's main or alternative source of supply @ 1000 liters per minute. The static storage water supply required for the above mentioned purpose should entirely be accessible to the fire tenders of the local fire service. Provision of suitable number of manholes shall be made available for inspection repairs and insertion of suction hose etc. The covering slab shall be able to withstand the vehicular load of 45 tonnes in case of high rise and 22 tonnes in case of low rise buildings. A draw off connection shall be provided. The slab need not strengthened if the static tank is not located in mandatory set- back area.

b) To prevent stagnation of water in the static water tank the suction tank of the domestic water supply shall be fed only through an over flow arrangement to maintain the level therein at the minimum specified capacity.

c) The static water storage tank shall be provided with a fire brigade collecting branching with 4 Nos. 63mm dia instantaneous male inlets arranged in a valve box with a suitable fixed pipe not less than 15 cm dia to discharge water into the tank. This arrangement is not required where down comer is provided.

A.22 AUTOMATIC SPRINKLERS

Automatic sprinkler system shall be installed in the following buildings:

a) All buildings of 24 m. and above in height, except group housing and 45 m. and above in case of apartment /group housing society building.

b) Hotels below l5 m. in height and above 1000 sq m. built up area at each floor and or if basement is existing.

c) All hotels, mercantile, and institutional buildings of 15 m. and above.

d) Mercantile building having basement more than one floor but below 15 m. (floor area not exceeding 750 sq m.)

e) Underground Shopping Complex.

f) Underground car / scooter parking /enclosed car parking.

g) Basement area 200 sq m. and above.

h) Any special hazards where the Chief Fire Officer considers it necessary.

i) For buildings up to 24 m. in height where automatic sprinkler system is not mandatory as per these Bye-Laws, if provided with sprinkler installation following relaxation may be considered.

- Automatic heat/smoke detection system and M.C.P. need not be insisted upon.
- The number of Fire Extinguisher required shall be reduced by half.

A.23 FIXED CARBON DI-OXIDE / FOAM / DCO WATER SPRAY EXTINGUISHING SYSTEM

Fixed extinguishing installations shall be provided as per the relevant specifications in the premises where use of above extinguishing media is considered necessary by the Chief Fire Officer.

A.24 FIRE ALARM SYSTEM

All buildings of 15 m. and above in height shall be equipped with fire alarm system, and also residential buildings (Dwelling House, Boarding House and Hostels) above 24 m. height.

a) All residential buildings like dwelling houses (including flats) boarding houses and hostels shall be equipped with manually operated electrical fire alarm system with one or more call boxes located at each floor. The location of the call boxes shall be decided after taking into consideration their floor without having to travel more than 22.5 m.

b) The call boxes shall be of the break glass type without any moving parts, where the call is transmitted automatically to the control room without any other action on the part of the person operating the call boxes.

c) All call boxes shall be wired in a closed circuit to a control panel in a control room, located as per Bye-Laws so that the floor number from where the call box is actuated is clearly indicated on the control panel. The circuit shall also include one or more batteries with a capacity of 48 hours normal working at full load. The battery shall be arranged to be a continuously trickle charged from the electric mains.

d) The call boxes shall be arranged to sound one or more sounders so as to ensure that all occupants of the floor shall be warned whenever any call box is actuated.

e) The call boxes shall be so installed that they do not obstruct the exit ways and yet their location can easily be noticed from either direction. The base of the call box shall be at a height of 1.5 m. from the floor level.

f) All buildings other than as indicated above shall, in addition to the manually operated electrical fire alarm system, be equipped with an automatic fire alarm system.

g) Automatic detection system shall be installed in accordance with the relevant standard specifications. In buildings where automatic sprinkler system is provided, the automatic detection system may not be insisted upon unless decided otherwise by the Chief Fire Officer.

Note: Several type of fire detectors are available in the market but the application of each type is limited and has to be carefully considered in relation to the type of risk and the structural features of the building where they are to be installed.

A.25 CONTROL ROOM

There shall be a control room on the entrance floor of the building with communication system (suitable public address system) to all floors and facilities for receiving the message from different floors. Details of all floor plans along with the details of fire fighting equipment and installation shall be maintained in the Control Room. The Control Room shall also have facility to detect the fire on any floor through indicator boards connecting fire detection and alarm system on all floors. The staff in charge of the Control Room shall be responsible for the maintenance of the various services and fire fighting equipment and installation. The Control Room shall be manned round the clock by trained fire fighting staff.

A.26 FIRE DRILLS AND FIRE ORDERS

The guidelines for fire drill and evacuation etc. for high-rise building may be seen in Appendix (B) of National Building Code part IV. All such building shall prepare the fire orders duly approved by the Chief Fire Officer.

A.27 A qualified fire officer and trained staff shall be appointed for the following buildings.

a) All high rise buildings above 30 m. in height where covered area of one floor exceeds 1000 sq m. except apartments / group housing.

b) All hotels, identified under classification three star and above category by Tourism Department and all hotels above 15 m. in height with 150 beds capacity or more without star category.

c) All hospital building of 15 m. and above or having number of beds exceeding 100.

d) Underground shopping complex where covered area exceeds 1000 sq m.

e) All high hazard industries.

f) Any other risk which Chief Fire Officer considers necessary.

A.28 The lightening protection warning light (red) for high-rise buildings shall be provided in accordance with the relevant standard. The same shall be checked by electrical department.

A.29 MATERIAL USED FOR CONSTRUCTION OF BUILDING

a) The combustible/flammable material shall not be used for partitioning, wall paneling, false ceiling etc. Any material giving out toxic gases/smoke if involved in the fire shall not be used for partitioning of a floor or wall paneling or a false ceiling etc. The surface frames spread of the lining material shall conform to class-I of the standard specification. The framework of the entire false ceiling would be provided with metallic sections and no wooden framework shall be allowed for paneling/false ceiling.

b) Construction features/elements of structures shall conform to National Building Code and BIS code

A.30 LPG

The use of LPG shall not be permitted in the high-rise building except residential/hotel/hostel/kitchen/pantry (if any) and shall be located at the periphery of the building on the ground level.

A.31 HOUSE KEEPING

A high standard of house keeping must be insisted upon by all concerned. There must be no laxity in this respect. It must be borne in mind that fire safety is dependent to a large extent upon good housekeeping.

A.31.1 Good House-Keeping includes the following:-

a) Maintaining the entire premises in neat and clean condition.

b) Ensuring that rubbish and combustible material are not thrown about or allowed to accumulate, even in small quantity, in any portion of the building. Particular attention must be paid to corners and places hidden from view.

c) Providing metal receptacles/waste paper basket (of non-combustible material) at suitable locations for disposal of waste. Separate receptacles must be provided for disposal of cotton rags/waste, wherever it is generated, these must under no circumstances be left lying around in any portion of the building.

d) Ensuring that receptacles for waste are emptied at regular intervals and the waste removed immediately for safe disposal outside the building.

e) Ensuring that all doors/fixtures are maintained in good repairs, particular attention must be paid to self-closing fire smoke check doors and automatic fire/doors/rolling shutters.

f) Ensuring that self-closing fire/smoke check doors close properly and that the doors are not wedged open.

g) Ensuring that the entire structure of the building is maintained in good repairs.

h) Ensuring that all electrical and mechanical service equipments are maintained in good working condition at all times.

i) Ensuring that Cars / Scooters etc. are parked systematically in neat rows. It is advisable to mark parking lines on the ground in the parking areas near the building and in the parking area on ground floor and in basement(s); as applicable, inside the building. A parking attendant must ensure that vehicles are parked in an orderly manner and that the vehicles do not encroach upon the open space surrounding the building.

A.31.2. Smoking Restrictions

a) Smoking shall be prohibited throughout the basement(s) and in all areas where there is a profusion of combustible materials. Easily readable "NO SMOKING" signs must be conspicuously posted at locations where they can catch the eye. Each sign must also include a pictograph. The sign may also be illuminated.

b) In all places where smoking is permitted ashtrays, half filled with water, must be placed on each table/at each other suitable locations for safe disposal of spent smoking material. The design of the ashtrays must be such that they cannot easily topple over. If, for any reason, this is not practicable a minimum of one metal bucket or other non-combustible container half filled with water must be provided in each compartment for disposal of spent smoking materials.

A.31.3 Limiting the Occupant Load in Parking and Other Areas of Basement(s)

Where parking facility is provided in the basement(s) no person other than the floor-parking attendant may be allowed to enter and remain in the parking areas except for parking and removal of Cars/Scooters. Regular offices must not be maintained in the storage /parking area in the basement(s). The stores / godowns must be opened for the limited purpose of keeping or removing stores.

No person other than those on duty may be permitted in the air-conditioning plant room(s), HL/LT switch room, transformer compartment, control room pump-house, generator room, stores and records etc.

A.32 FIRE PREVENTION

In addition to the measures recommended above, the following fire prevention measures must be implemented when the building is in occupation.

a) Storage of flammable substances, such as diesel oil, gasoline, motor oils, etc must not be allowed anywhere within the building. The only exception to this rule may be:

i) Storage of diesel oil in a properly installed tank in a fire-resisting compartment in the generator room;

ii) Diesel oil, gasoline, motor oil etc, filled in the vehicle tanks.

b) Preparation of tea and warming of food must be prohibited throughout the building.

c) Where heaters are used during winters, the following precautions must be taken.

i) All heaters, except convector heaters, must be fitted with guards.

ii) Heaters must not be placed in direct contact with or too close to any combustible material.

iii) Heaters must be kept away from curtains to ensure that the latter do not blow over the heater accidentally.

iv) Heaters must not be left unattended while they are switched on.

v) Defective heaters must be immediately removed from service until they have been repaired and tested for satisfactory performance.

vi) Use of heaters must be prohibited in the entire basement, fire control room and in all weather maker rooms throughout the building. Also in all places where there is profusion of combustible flammable materials.

d) Use of candles or other naked light flame must be forbidden throughout the building, except in the offices (for sealing letters only) and kitchen. When candles/ spirit lamps are used for sealing letters/packets, extreme care must be take to ensure that paper do not come in direct contact with the naked flame and the candle/spirit lamp does not topple over accidentally while still lighted. All candles/spirit lamps kitchen fires must be extinguished when no longer required.

e) Fluorescent lights must not be directly above the open file racks in offices/record rooms. Where this is unavoidable, such lights must be switched on only for as long as they are needed.

f) Filling up of old furniture and other combustible materials such as scrap paper, rags, etc. must not be permitted anywhere in the building. These must be promptly removed from the building.

g) More than one portable electrical appliance must not be connected to any single electrical outlet.

h) Used stencils, ink smeared combustible materials and empty ink tubes must not be allowed to accumulate in rooms/compartments where cyclostyling is done. These must be removed and disposed off regularly.

i) All shutters/doors of main switch panels and compartments/shafts for electrical cables must be kept locked.

j) Aisles in record rooms and stores must have a clear uniform width of not less than 1.0 m. Racks must not be placed directly against the wall/partition.

k) In record rooms, offices and stores, a clear space of not less than 30 cm. must be maintained between the top-most stack of stores/records and the or lighting fittings whichever is lower.

l) A similar clearance, and at (k) above must be maintained from fire detectors.

m) Fire detectors must not be painted under any circumstances and must also be kept free from lime/distemper.

n) Records must not be piled/dumped on the floor.

o) Welding or use of blow torch shall not be permitted inside the building, except when it is done under strict supervision and in full conformity with the requirements laid down in IS: 3016-1966 code of practice for fire precautions in welding and cutting operation.

p) Printing ink/oil must not be allowed to remain on the floor, the floor must be maintained in a clean condition at all times.

A.33 OCCUPANCY RESTRICTIONS

a) The premises leased to any party shall be used strictly for the purpose for which they are leased.

b) No dangerous trade/practices (including experimenting with dangerous chemicals) shall be carried on in the leased premises;

c) No dangerous goods shall be stored within the leased premises.

d) The common/public corridor shall be maintained free of obstructions, and the lessee shall not put up any fixtures that may obstruct the passage in the corridor and/or shall not keep any wares, furniture or other articles in the corridor.

e) The penalty for contravention of the condition laid down below must be immediate termination of lease and removal of all offending materials.

f) Regular inspection and checks must be carried out at frequent intervals to ensure compliance with conditions above.