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मध्यप्रदेश राजपत्र

(असाधारण)

प्राधिकार से प्रकाशित

क्रमांक 307] भोपाल, सोमवार, दिनांक 12 अक्टूबर 2026–आश्विन 20, शक 1948

नगरीय विकास एवं आवास विभाग

मंत्रालय, वल्लभ भवन, भोपाल

Not. No. 14–F 3–3–4–0007–2026–XVIII–3 Bhopal the 12th October 2026

Whereas, it is expedient to provide for a comprehensive, uniform and effective framework for the organisation, administration and operation of fire and emergency services in the State of Madhya Pradesh;

and whereas, it is necessary to prescribe measures for fire prevention and life safety, establishment and operational readiness of fire stations, co-ordinated response to fire, rescue and other emergencies, regulation of fire plan approvals and fire safety certificates, periodic fire audits and inspections and fixing accountability of owners, occupiers, qualified agencies and other stakeholders;

and whereas, it is further necessary to strengthen institutional capacity, inter-departmental co-ordination, professional training, emergency preparedness, enforcement and the use of technology for securing the protection of life and property from fire and other emergencies;

now therefore, in exercise of the powers conferred by section 34 of the Madhya Pradesh Agnishaman Evam Apatkalin Sevayen Adhiniyam, 2026 (No. 16 of 2026), the State Government, hereby, makes the following rules, namely:—

RULES

CHAPTER-I

PRELIMINARY

1. Short title, extent and commencement.-

(1) These rules may be called the Madhya Pradesh Fire and Emergency Services General Rules, 2026.

(2) These rules shall extend to the whole of the State of Madhya Pradesh.

(3) They shall come into force with effect from the date of its publication in the Madhya Pradesh Gazette.

2. Definitions.-

(1) In these rules, unless the context otherwise requires, -

(a) "Act" means the Madhya Pradesh Agnishaman Evam Apatkalin Sevayen Adhiniyam, 2026 (No. 16 of 2026);

(b) "Competent Authority" shall mean and include the Commissioner of the Municipal Corporation, in respect of the Municipal Corporations, the District Collector, in respect of Municipalities, Special Area Development Authority and Rural Areas and the Executive Officer, in respect of the Cantonment Boards;

(c) "Designated Officer" means an officer, so designated under the provisions of these rules;

(d) "Divisional Commissioner" means a Commissioner of revenue division appointed by the State Government;

(e) "Existing buildings" means the buildings having their super structure completed prior to the

commencement of these rules, subject to the proof of existence issued by a local body, as defined under section 2 of the Act;

(f) "Field formation" means formation comprising of officer(s) having jurisdiction over fire region and training centers, as the case may be;

(g) "Fire, rescue or emergency call" means a request for assistance in the form of supply of equipment, appliances or personnel to effectively deal with the outbreak of a fire, rescue or emergency response made in accordance with the provisions of the Act;

(h) "Fire Safety Certificate" means the Fire Safety Certificate issued under section 13 of the Act;

(i) "Inspecting Authority" means personnel having jurisdiction in the area or any other designated officer;

(j) "Investigating Authority" means an officer or group of Officers, as authorized by the State Government or the Director or the competent Authority in this behalf;

(k) "Private entity" means an individual or group of individuals having lawful possession over resources in their personal capacity;

(l) "Schedule" means a schedule appended to these rules, which may be amended by the State Government, from time to time;

(m) "Specially Trained Rescue Group (STRG)" means a designated unit of the Madhya Pradesh Fire and Emergency Service, comprising personnel with advanced and specialized training in technical rescue,

disaster response, trauma care and complex emergency operations, as constituted under these rules.

(n) "State Fire and Emergency Training Academy" means State Fire and Emergency Training Academy established under section 26 of the Act;

(o) "Temporary Structure" means all structures with roof or walls made on temporary basis for a specific period, where public may assemble, including pandals, tents, shamiyanas, mandaps, cottages etc., but which is not adopted for permanent or continuous occupancy;

(p) "Turnout unit" means the group of fire personnel, along with vehicles and equipment, mobilized in response to a fire, rescue or emergency call.

(2) Words and expressions used but not defined in these rules, but defined in the relevant Act(s), bye-laws, rules, relevant standards, shall have the same meanings respectively, as assigned to them in the said Acts, rules, bye-laws or standards.

CHAPTER-II

ORGANIZATIONAL STRUCTURE

3. Functions of Director of fire and emergency service.- The Director shall perform the following functions,-

(a) to co-ordinate with the State Government for the development of fire and emergency service;

(b) to frame policies in relation to the development of fire and emergency service in the State and to take steps to implement the same, on approval by the State Government;

(c) to prepare and submit plans and proposals to the State Government, as regards the periodical review of fire equipment, appliances and fire manpower, for effective implementation of the fire and emergency service;

(d) to take or cause to be taken such effective steps and measures in cases of major fires, house collapse and other emergency services;

(e) to investigate or order to be investigated, for ascertaining the cause of fire and direct the authorities for implementing fire precautionary measures;

(f) to implement effective human resource policies, in accordance with the prescribed jobs at each level of fire service personnel; and

(g) to perform such other functions, as may be assigned by the State Government.

4. Constitution of fire and emergency service at the Urban Local Body level.-

(1) The State Government based on operational exigency and workload, shall establish fire and emergency service at the municipal level, as may be required. Subject to the supervision of the State Government, the Urban Local Bodies shall establish fire and emergency service, based on operational exigencies and workload.

(2) Each Urban Local Body shall include such fire stations, as may be notified by the State Government, from time to time.

(3) The State Government shall appoint a fire personnel to be in-charge of fire and emergency service.

CHAPTER-III
FORMATION OF FIRE STATIONS

5. Constitution of fire stations.-

(1) The State Government or the Urban Local Bodies may constitute one or more fire stations and shall be responsible for deployment, to ensure continuous operational readiness and enhanced overall efficiency in shift duties.

(2) The Urban Local Bodies shall provide each fire station with minimum operational facilities necessary for fire-fighting and rescue operations.

6. Construction or hiring of places for fire stations.-

(1) The Urban Local Bodies shall identify such areas, where the construction of a fire station would be tactically advantageous for the effective delivery of fire and emergency service.

(2) All fire stations shall be constructed in conformity with the norms, specifications and guidelines issued by the State Government, from time to time:

Provided that the Director may also consider and approve modifications and/or alterations to the standard

fire station layout, through a General Arrangement Plan, having due regard to land availability, assessed fire risk and resource deployment requirements.

7. Limits and extent of fire station.-

(1) The limit and extent of each fire station shall correspond to the jurisdiction and extent of the respective urban local bodies:

Provided that, where the competent Authority is of the opinion, that it is necessary or expedient to do so, in the interest of ensuring the prompt deployment and attendance of fire and emergency service, it may alter, modify or redefine the limits and extent of fire stations.

(2) The Urban Local Bodies may constitute Specially Trained Rescue Groups (STRGs), comprising personnel with advanced training in disaster response and rescue operations, to function in high-risk or hazard-prone areas.

CHAPTER-IV
OPERATIONS

8. Equipment and appliances for fire and emergency service.-

(1) The Director and the Urban Local Bodies, shall assess and determine the requisite equipment and appliances necessary for fire-fighting, personal protection, rescue operations and other emergency services. Such determination shall be made with due regard to the assessed fire risk and hazard potential within the respective areas and shall include the quantity, type and

technical specifications of such equipment, as may be required to ensure effective safety measures and efficient operational response during emergencies and disaster situations.

(2) The Director and the Urban Local Bodies, shall procure the equipment and appliances, as determined under sub-rule (1) above, subject to the budgetary allocation. Such procurement shall be carried out in a manner, that ensures each fire station is adequately equipped to effectively respond to fire incidents, disasters, emergency situations and to carry out fire-fighting, rescue, personal protection and other emergency response operations, as well as to implement requisite fire safety measures.

(3) The Urban Local Bodies shall also make all necessary arrangements for the upkeep, repair and maintenance of such equipment and appliances, to always ensure their operational readiness and availability for fire and emergency service.

(4) The number, type and prescribed service life of equipment and appliances shall be determined, in accordance with the recommendations of the Standing Fire Advisory Council, under the Ministry of Home Affairs, Government of India or such other authority, as may be designated by the State Government.

9. Resources from other fire station during fire, rescue, and emergency calls.-

(1) The officer-in-charge of a fire station shall be empowered to initiate a request and seek assistance for fire, rescue or

emergency response resources, based on an incident reported or observed within his area of jurisdiction. Such requests may include the deployment of personnel, appliances and specialized equipment required to manage the emergency.

(2) Upon assessing the nature and scale of the emergency, the officer-in-charge shall dispatch the necessary fire units. Every such deployment shall be reported without delay.

(3) The seniormost fire officer present at the scene shall function as the officer-in-charge, assuming full command over all deployed units, personnel and equipment. The officer-in-charge shall also ensure the maintenance of detailed records of all such emergency calls, response actions and incident outcomes.

10. Enrolment of fire and emergency volunteers.-

(1) The State Government may organize an auxiliary fire and emergency service, to function as a volunteer force or in any other format or structure, as may be determined by the State Government, for a specified duration and subject to such terms and conditions, as may be prescribed.

(2) For the purpose of augmenting the operational capacity of the fire and emergency service, the Urban Local Bodies may enrol for a limited period, suitably trained individuals from amongst the general public.

(3) All volunteers shall undergo a certified short-term professional course spanning a calendar duration of not less than fifteen (15) consecutive days and not exceeding thirty (30) days, at an Institute to be notified by the State

Government, so as to equip themselves with basic principles of fire science, hands-on enabling of portable and stationary fire extinguishers, emergency egress and evacuation drills, first aid and any other basic fire and emergency response protocol.

(4) Such volunteers may be engaged to,-

(a) assist in fire-fighting, rescue and life safety operations within their local area;

(b) support uniformed personnel during emergencies and disaster response activities;

(c) participate in public awareness campaigns and preventive fire safety education initiatives.

11. Fire station general diary or occurrence logbook.-

(1) Every fire station shall maintain a bound and sequentially paginated fire station general diary or occurrence logbook, wherein all incidents, communications, movements, operational activities and other relevant events shall be recorded promptly and contemporaneously, forthwith upon the occurrence of the event or on the receipt of the report, to which the entry pertains in the prescribed format, as well as on the online portal.

(2) A fire incident report, along with analysis and case study shall be made within a period of two weeks, from the date of occurrence of the fire incident.

(3) The same shall be submitted to the higher authorities at prescribed intervals or as the exigency of the situation may arise.

12. Direction and control of emergency response operations.- The response of the fire and emergency service, to any incident involving the outbreak of fire or any other emergency situation requiring intervention, shall be conducted in strict adherence to the directions issued by the competent Authority or the officer- in-charge of the Urban Local Body, as may be warranted by the nature, scale and urgency of the situation.

13. Authority for planning and deployment.-

(1) The competent Authority and the Urban Local Bodies shall possess the authority to plan, organize and deploy both personnel and equipment, in accordance with the operational strategies and directives issued by the State Government, from time to time.

(2) Such deployment shall be carried out in a manner, that ensures the maximum preservation of human life and property under threat from fire and/or emergency situations, while prioritizing the safety of responding fire personnel.

14. Requisition of equipment and personnel from Government, private sources etc., during emergencies.- On the occasion of a fire or emergency, if the situation so demands for effective fire suppression, rescue and protection of fire appliances and preservation of life and property, the competent Authority shall have the authority for requisitioning any fire-fighting personnel or equipment available with private entities, Public Sector Undertakings, Government departments etc. and it shall be the lawful duty of such entities

to forthwith provide the available equipment and resources under their control.

CHAPTER-V

GENERAL MEASURES AND EMERGENCY PROVISIONS RELATING TO FIRE AND LIFE SAFETY

15. Fire and life safety requirements for permanent buildings and premises.- For the purpose of achieving adequate fire and life safety measures in a building or premises, the minimum standards for fire prevention and fire safety shall be determined with respect to the height, cover area and class of occupancy of such building or premises, as are warranted in the Madhya Pradesh Bhumi Vikas Rules, 2012 and relevant standards, as applicable to such building or premises at the time of construction or approval of the map thereof, namely:-

(a) access to building;

(b) number, width, type and arrangement of exits;

(c) smoke management system in controlled environment building;

(d) fire extinguishers;

(e) first-aid hose reels;

(f) automatic fire detection and alarming system;

(g) public address system;

(h) automatic sprinkler system;

(i) internal hydrants and yard hydrants;

(j) pumping arrangements;

(k) captive water storage for fire-fighting;

(l) exit signage;

(m) fire lifts;

(n) standby power supply;

(o) refuge area;

(p) special fire protection systems for protection of special risks, if applicable;

(q) Manually Operated Electronic Fire Alarm System (MOEFA);

(r) electrical safety audit report issued by the State Government or a contractor duly authorized by the State Government in this behalf, including calculation of load generation in air conditioners and generators;

(s) certificate for installation of fire protection system by a qualified agency, as applicable;

(t) appointment of a fire safety supervisor;

(u) safety certificate of lift issued by the competent authority, if required.

16. Applicability of fire and life safety measures.-

(1) The fire and life safety measures shall be such as prescribed in these rules and all other instructions issued in this behalf by the State Government, from time to time.

(2) The provisions relating to fire and life safety shall apply to all categories of buildings, whether existing, under construction, or proposed to be constructed. The assessment of such buildings shall be carried out exclusively from the perspective of fire and life safety.

17. Access to building for emergency response.- Access to the building shall mean the provision of a clear and unobstructed

means of approach to each floor of the building or at a minimum to the nearest feasible point of the structure from at least one side, such as a road, permanent open space or other similar accessible route. Such access shall be mandatorily ensured to facilitate fire-fighting and rescue operations during emergency situations and its availability shall be a prerequisite for compliance with fire safety regulations.

18. Exemption from obtaining fire safety certificate.-

(1) Except the permanent buildings or premises (having a height exceeding a certain extent or having a certain area exceeding on any floor), as mentioned in the table below, all other buildings or premises shall be exempt from obtaining fire safety certificate from the competent Authority.

S. No.	Occupancy	Height, beyond which provisions are applicable	Floor area, beyond which provisions are applicable (per floor)
(1)	(2)	(3)	(4)
(i)	Residential	24 m	750 m^2
(ii)	Educational	15 m	500 m^2
(iii)	Institutional	15 m	500 m^2
(iv)	Assembly	15 m	750 m^2
(v)	Business	15 m	750 m^2
(vi)	Mercantile	15 m	750 m^2
(vii)	Industrial – low hazard (G-1)	Any height	Total area exceeds 2000 m^2
(viii)	Industrial – moderate hazard (G-2)	Any height	Total area exceeds 2000 m^2
(ix)	Industrial – high hazard (G-3)	Any height	Total area exceeds 500 m^2
(x)	Storage	15 m	500 m^2
(xi)	Hazardous	Any height	Any Area
(xii)	Mixed use	15 m	1000 m^2

Note.-

1. The buildings or premises or part thereof, that have already obtained a fire safety certificate under the provisions of the Occupational, Safety, Health and Working Conditions Code, 2020 (37 of 2020) or rules to be made or notifications to be issued thereunder, shall be exempted from obtaining a certificate to that effect under these rules.
2. For a mixed use building or premises, the most stringent provisions for fire safety shall apply.

(2) The State Government may review the necessity of obtaining a certificate, from time to time.

19. Fire audit and report.- The fire audit of buildings shall be carried out annually and the owner of the building shall be responsible for the following, namely:-

(a) submission of fire audit report, by 30th of June of every financial year;

(b) If the owner fails to comply with the provisions of clause (a) above, a show cause notice shall be issued to him, alongwith a direction to submit the same in the next three months. After giving a reasonable opportunity of being heard, a decision regarding cancellation of fire plan approval/fire safety certificate may be taken.

20. Declaration and inspection of fire safety measures, liability to maintain fire safety standards.-

(1) In accordance with the provisions of section 12 of the Act, the owner or occupier of a building or premises shall, after obtaining a certificate from the competent authority, submit an annual declaration, alongwith the fire audit report. The declaration to be made on the official online portal shall affirm, that the fire prevention and life safety

measures in the building or premises are intact, functional and fully operational.

(2) It shall be lawful for a fire officer or a group of fire officers authorised by the Competent Authority or the Director, as the case may be, to enter and inspect the building or premises, under the provisions of section 17 of the Act, for the purpose of verifying the correctness of the declaration submitted under sub-rule (1) above and,-

(a) any deficiencies observed during such inspection shall be reported to the competent Authority. The deficiencies so observed shall be geo-referenced, time-stamped, as well as video recorded and attached along with the report;

(b) upon receipt of such a report, the competent Authority shall issue a notice to the owner or occupier of the building, as the case may be, directing the rectification of the deficiencies within a period not exceeding thirty (30) days.

(3) If the owner or occupier fails to comply with the notice issued under clause (b) of sub-rule (2) above, within the specified time limit, the building or premises shall be deemed "Unfit" or "Unsafe" from a fire safety perspective and appropriate action shall be initiated under sub-section (4) of section 18 of the Act.

(4) Where, the owner or occupier, after issuance of notice under clause (b) of sub-rule (2) above, undertakes the rectification of deficiencies, within the stipulated period, a follow-up inspection shall be conducted. Upon verification

of compliance, the building or premises shall be deemed to have restored its fire safety compliance status.

21. Fire safety standards for temporary structures.-

(1) The minimum requirements for fire prevention and fire safety, in relation to temporary structures, such as mandaps, shamiyanas, tents, pandals etc., erected for public, private, religious, cultural or ceremonial purposes, shall conform to the standards issued by the State Government, from time to time.

(2) The responsibility for ensuring compliance with the prescribed standards shall rest with the owner, event organizer or the person or entity responsible for erecting such temporary structures. The compliance shall specifically extend to the following aspects, but not be limited to,-

(a) provision for adequate and unobstructed access to the temporary structure;

(b) maintenance of sufficient open space around the structure to facilitate fire-fighting operations;

(c) safe distance from medium and high voltage overhead electrical transmission lines and other hazardous installations;

(d) availability of an adequate number of properly marked and unobstructed means of exit;

(e) use of construction materials, that are non-combustible or treated with fire-retardant substances;

(f) installation of basic first-aid fire-fighting equipment and use of fire-retardant sprays on flammable materials;

(g) provision for adequate water storage dedicated for fire-fighting purposes;

(h) electrical installations and wiring, duly inspected and certified by the competent authority or a licensed electrical contractor;

(i) calculation of load generation in air conditioners, generators and other electrical equipments.

22. Prior declaration and public display of fire safety compliance.-

(1) Every individual or entity responsible for organizing, owning, or erecting a temporary structure, such as a mandap, shamiyana, tent or pandal, shall be required to submit a written declaration of compliance with fire safety norms, not later than forty-eight (48) hours, prior to the scheduled commencement of the event.

(2) Such declaration shall be accompanied by a detailed layout plan, indicating the proposed access routes, surrounding open spaces and designated exits and shall certify, that all fire prevention and safety measures, as specified under rule 21, have been properly implemented.

(3) The declaration and layout shall be submitted to the competent authority for verification and record.

(4) In addition, a copy of the duly signed declaration shall be prominently displayed at a clearly visible location within the premises of the temporary structure throughout the

duration of the event, so as to inform the public and authorities of due compliance with the applicable safety standards.

23. Inspection and verification of fire and life safety measures in temporary structures.-

(1) To ensure compliance with the self-declaration submitted by the organizer, owner or erector of temporary structures, a fire officer shall be deputed to verify that the fire prevention and life safety measures declared therein are actually implemented.

(2) Such verification shall be carried out by an officer authorized by the competent Authority. The officer shall physically inspect the temporary structure to identify any deficiencies, deviations or non-compliance with the standards.

(3) If, upon inspection, any deviation, deficiency or lapse is identified, the Inspecting Officer shall issue a notice to the organizer or erector, clearly stating the shortcomings and directing that corrective measures be taken and such deficiencies be rectified within a period not exceeding eight (8) hours from the time of issuance of the said notice.

24. Risk assessment and declaration of unfit or unsafe structures.- Where the owner, organizer or erector fails to rectify the deficiencies identified during inspection, the temporary structure may be declared unfit or unsafe from the perspective of fire and life safety.

25. Sealing and enforcement procedure.-

(1) Upon receipt of the declaration, the officer-in-charge shall send a report to the competent Authority, along with a recommendation for sealing the unsafe structure.

(2) The competent Authority shall serve a show-cause notice to the concerned party. This notice shall be served in a manner, which the competent Authority deems appropriate, who shall also provide an opportunity to show cause, why the structure or any encroaching object should not be removed or sealed.

(3) If, after due consideration, the competent Authority is satisfied that continued operation of the structure poses a grave risk to public safety or obstructs emergency response operations, he may pass an order directing the sealing of the unsafe structure or any part thereof, including goods or encroachments.

26. Seizure, inventory and cost recovery.-

(1) The officer tasked with executing the sealing or removal order shall prepare a detailed inventory of all items, goods or materials seized or removed during the operation. A signed copy of the inventory and a written notice of seizure shall be provided to the person, from whose possession the items are seized.

(2) If any items seized are claimed by persons, other than the original organizer or erector, the executing officer shall record such claims and verify the same, making appropriate notations in the seizure report.

(3) All seized items shall be stored in a designated safe location and shall not be released without express written permission from the competent Authority.

(4) The cost of executing such sealing, removal, transportation and storage shall be recoverable from the owner, organizer or erector of the structure as an arrear of land revenue.

CHAPTER VI

STANDARD OPERATING PROCEDURE FOR FIRE AND EMERGENCY CALLS

27. General responsibility for fire and emergency calls.- Each fire station shall serve as the initial response unit to any fire or emergency incident reported within its designated area. The response protocol shall be executed in accordance with this Standard Operating Procedures (SOPs), as may be determined by the State Government.

28. Modes of receiving emergency calls.- Emergency calls concerning fire, rescue or other exigencies may be received at the Fire Station Control Room or I-CCC, through any of the following channels, namely:-

(a) the designated Fire Control Room telephone line;

(b) electronic transmission, via the Mobile Data Terminal (MDT) associated with Emergency Helpline 112;

(c) telephonic communication from Government officials, fire personnel or any other authorized person;

(d) reporting by any individual at the fire station, in-person.

29. Documentation of information.- Upon receipt of any emergency call, the Fire Control Room Operator shall immediately record all material details in the incident log book, including but not limited to,-

(a) exact location of the incident;

(b) nature and category of the emergency;

(c) presence of any injuries, fatalities or persons trapped;

(d) any other relevant or supplementary information provided.

30. Communication to authorities and dispatch protocol.-

(1) The Fire Control Room Operator or Day Officer shall promptly relay the details of the emergency to the officer-in-charge of the fire station.

(2) A completed incident location and information slip shall be handed over to the fireman of the first turnout unit.

(3) The turnout of fire personnel and resources shall be executed, in accordance with the deployment matrix, as may be determined by the State Government, from time to time.

31. On-site assessment and escalation.-

(1) Upon arrival at the incident site, the officer-in-charge shall make an immediate on-site operational assessment of the emergency.

(2) If the actual risk level is determined to be higher or lower than what was initially reported, he shall,-

(a) immediately notify the higher authorities and the originating fire station control room;

(b) direct additional deployment or demobilization, in accordance with established protocols.

32. Operational control of fire and emergency responses.- At the response to any emergency or disaster, the senior-most fire officer present, shall assume the role of officer-in-charge and exercise operational control over all fire-fighting, rescue and emergency response efforts and all resources, whether from within the fire services or extended by external agencies, shall operate under his unified command, thereby ensuring a co-ordinated and effective emergency response.

33. Authority to deploy resources.-

(1) The officer-in-charge of a fire station or any other fire officer duly authorised by the Urban Local Body shall be empowered to deploy personnel and equipment to respond to any fire or emergency situation.

(2) Upon receipt of a fire or emergency call, the Officer-in-Charge of fire station shall immediately mobilize and dispatch the required fire and emergency resources to the incident site.

34. Intimation to other departments by control room, after dispatching fire tender to the incident site.-

(1) **Energy Department** - The officers/employees of Power Distribution Company concerned may be requested to disconnect/cut-off the power supply of fire accident site and they shall cut-off the power supply of shops/buildings/offices etc. located in the vicinity of fire accident site, to ensure that no loss is caused to the personnel, while extinguishing the fire and they shall be

directed to appoint a responsible employee(s) of power department at the incident site till the control of fire accident. The said department shall provide power supply separately for equipment/tools, which runs with power energy like cutter, spreader and wall breaker etc, belonging to the fire department.

(2) **Police station.–** The control room may intimate the police station of the area concerned, about fire accident site and may seek assistance from the police station for dispatching police personnel to the accident site to disperse the unwanted crowd gathered at accident site away from the fire accident site or for any other help in this regard, so that the fire extinguishing job may be carried out smoothly, without any hindrance.

(3) **Medical center.-** The control room shall give the information about fire accident spontaneously to a medical center or ambulance service providing Institutions, situated near fire accident site, so that the fire accident victim(s), if any, may be shifted immediately to the medical center(s) for the receipt of medical treatment aid, without delay.

(4) **Municipal Corporation, Municipality/Public Works Department (PWD).-** Heavy vehicles like dozer, dumper, JCB, etc., shall be demanded from Municipal Corporation for road clearance in fire accident or in case of building collapse, for removal of debris, so that there is no hindrance for the movement of fire tenders and shall direct the water tanker filling center, to ensure that there is no hindrance in continuous supply of water to fire tenders.

35. Inquiry about origin or cause of fire incident.-

(1) The competent Authority or any fire officer, duly authorized in this behalf, may, if circumstances so warrant, constitute a site investigation team, to conduct an inquiry into the origin and cause of a fire incident.

(2) Such inquiry may be carried out in co-ordination with or through a Fire Forensic Laboratory. Based on the findings of the inquiry, the concerned Authorities shall take appropriate preventive measures to mitigate recurrence of such fire incidents in the future.

36. Adherence to training standards.- It shall be the duty of the Director, the Competent Authority and the respective Urban Local Body, to ensure that all personnel are,-

(a) adequately trained in fire-fighting, rescue and emergency response; and

(b) possessing sufficient topographical awareness and tactical knowledge concerning specific fire hazards and risk scenarios prevailing in their areas of operation.

CHAPTER-VII
WATER SUPPLY

37. Authority to access water sources during fire-fighting operations.- During the course of fire-fighting operations, the Urban Local Body or fire station, having jurisdiction over the affected area, shall have the authority to draw water from any source under the control of any local authority or a

private entity, as may be necessary for effective mitigation of the incident.

38. Provision of shared fire-fighting and emergency infrastructure.-

(1) Notwithstanding anything to the contrary contained in any other law for the time being in force, the competent authority may permit the establishment, operation and maintenance of common and shared fire-fighting and emergency response infrastructure within the industrial areas.

(2) The shared infrastructure permitted under sub-rule (1) above, may include, but shall not be limited to,-

(a) public fire hydrants and integrated ring mains;

(b) centralized fire water storage tanks and specialized static water networks;

(c) high-capacity fire pumping systems;

(d) interconnected fire alarm, detection and early-warning systems; and

(e) dedicated emergency response infrastructure, equipment and related fire protection facilities.

(3) The provision of shared and common fire-fighting infrastructure specified under sub-rule (2) above, shall be recognized as an authorized alternative to individual plot-level fire-fighting installations for industrial units operating within such designated areas:

Provided that such alternative arrangement shall be subject to strict compliance with such applicable safety norms, relevant codes and standards, as may be prescribed.

CHAPTER VIII

FIRE SAFETY CERTIFICATE

39. Application for fire plan approval/fire safety certificate.-

(1) In order to obtain a fire plan approval/fire safety certificate, the owner of the building or premises shall submit an application, along with all relevant maps, drawings and documents, as specified on the official online portal, accompanied by such fee, as may be prescribed by the State Government, from time to time.

(2) No person other than the owner, as mentioned in this rule shall canvas or act as the applicant for the purpose of securing a fire plan approval/fire safety certificate.

40. Liability to maintain fire safety measures.-

(1) The owner of the building or premises shall declare every year, that fire prevention and fire safety measures are provided in the building or premises.

(2) The owner/occupier of the building or premises, as the case may be, shall maintain fire prevention and fire safety measures provided in the building or premises at all times in best repairs for the use of the occupants or personnel of fire service or both, in the event of an outbreak of fire.

(3) It shall be lawful for the competent Authority or any officer authorised by him, to enter and inspect the building or premises, with a view to verify the correctness of the declaration made under sub-rule (1) above and to point out the shortcomings, if any. The competent Authority shall direct the rectification of shortcomings, within a

specified time. If the directions of the competent Authority are not complied within the time limit so given, it shall declare the building or premises unfit and direct the local body or any other authority concerned to disconnect the electricity and water supply to the building or the premises and the local body or the other authority shall comply with the directions of the competent Authority.

(4) The owner or the occupier of the building or premises, who falsely makes a declaration, in contravention of the provision made under sub-rule (1) above, shall be deemed to be in default and shall be held liable under the provisions of the Act.

41. Issuance of fire plan approval/fire safety certificate.-

(1) Upon receipt of an application for Fire Plan Approval/Fire Safety Certificate, submitted through the online portal, the competent Authority shall scrutinize the applications and issue Fire Plan Approval. However, for issuance of Fire Safety Certificate, the concerned building or premises shall be subjected to an inspection by the competent Authority or officer designated, having jurisdiction over the area, in accordance with section 17 of the Act.

(2) The purpose of the inspection shall be to verify the existence, adequacy and operability of the fire prevention and fire safety measures, as prescribed under rule 15.

(3) Following such procedure, as laid down in sub-rule (1) of rule 41, the competent Authority may either grant or refuse to grant fire plan approval/fire safety certificate, in the format prescribed.

(4) Pursuant to the provisions of section 13 of the Act and based on the categorization of the building or premises, the competent Authority shall issue a fire plan approval/fire safety certificate, subject to conditions, to ensure compliance with the fire prevention and life safety measures.

(5) A fire plan approval shall normally remain valid for a period of three years, whereas a fire safety certificate shall remain valid for a period of five years from the date of its issuance respectively:

Provided that the State Government may alter the period of validity of a fire plan approval/fire safety certificate.

(6) The obtainment of a fire plan approval is a condition precedent for the issuance of a fire safety certificate and the validity period of the fire plan approval shall be co-terminus with the validity of the building plan permission.

42. Procedure for renewal of fire safety certificate.-

(1) An application for the renewal of a fire safety certificate shall be submitted through the designated online portal. Such application shall be made not later than sixty (60) days, prior to the date of expiry of the said certificate.

(2)In the case of existing buildings, where an application is made for the renewal of fire safety certificate, the inspecting officer shall undertake an assessment of the fire protection and life safety systems installed in the building or premises. For existing buildings, without undergoing structural

alterations, the fire and life safety norms in force at the time, shall be applicable.

(3) Upon receipt of the inspection report, the competent Authority may, either issue the Fire Safety Certificate in the prescribed form or reject the application stating reasons for such refusal, in writing, through the online portal:

Provided that, if a decision regarding renewal of fire plan approval/fire safety certificate is not arrived at by the issuing authority, until the date of expiry of the certificate, the certificate shall continue to remain operational, till a decision is arrived at and its validity shall extend whilst such duration.

43. Fresh application upon rejection of fire plan approval/fire safety certificate.-

(1) In the event of rejection of an application for the grant of a fire plan approval/fire safety certificate, the owner may submit a fresh application under rule 39, after duly complying with the deficiencies or requirements and without prejudice to the previous order, the application shall be evaluated afresh.

(2) Where the compliance is found satisfactory and in conformity with the prescribed fire safety measures, the application for the fire plan approval/fire safety certificate shall be issued.

(3) Where an applicant feels aggrieved by the rejection of his application, despite ensuring compliance with the deficiencies or requirements, he may prefer an appeal, in accordance with the provisions of rule 52.

44. Display of fire plan approval/fire safety certificate.-

(1) Photocopies of the fire plan approval/fire safety certificate issued under rule 41 shall be appropriately framed and prominently displayed within the premises.

(2)The purpose of such display shall be to ensure public awareness and transparency regarding the fire safety status of the building or premises.

45. Revocation of fire plan approval/fire safety certificate on account of violation.-

(1) Where any information brings to notice a breach of fire safety or where such breach is detected *suo motu* during an inspection, the fire officer in-charge or officer designated shall initiate a fact-finding process.

(2) If upon such inquiry, the fire officer in-charge or officer designated determines that any requirement forming the basis of issuance of a fire plan approval/fire safety certificate has been violated, he shall prepare a detailed written report highlighting the nature, extent and specific circumstances of the non-compliance.

(3) The said report shall be sent to the competent Authority, which issued the fire plan approval/fire safety certificate, for further action.

(4) Upon receipt of the report, the issuing competent Authority shall at the earliest, issue a notice to the owner or their authorized representative, requiring them to furnish a written explanation, within seven (7) days from the date of service of such notice.

(5) After providing an opportunity of being heard, the competent authority may proceed to revoke the fire plan approval/fire safety certificate, recording reasons thereof, in writing.

46. Procedure for action, in cases of non-compliance or partial compliance with fire safety requirements,-

(1) Where any building or premises is found to be in violation of or not fully compliant with, the mandatory fire safety measures prescribed under the Act or these rules or the notifications issued, from time to time and such non-compliance poses an imminent risk to life or property, the designated officer shall,-

(a) conduct a formal assessment of the risk arising from such non-compliance;

(b) record findings of such assessment, in writing; and

(c) submit a detailed report to the competent authority, recommending appropriate remedial or preventive action.

(2) Upon submission of the report under sub-rule (1) above, the competent authority shall be empowered to,-

(a) initiate the process for sealing the non-compliant premises, subject to prior documentation of reasons;

(b) institute proceedings under the applicable provisions of the Act, upon recording the grounds and justifications for such action in the official record.

47. Inspection of fire-prone goods and removal thereof.-

(1) A detailed inspection report shall be prepared by fire officer in-charge, which shall be submitted to competent Authority for examining and ascertaining the risk associated with the

presence of any goods or materials likely to cause fire hazards.

(2) Upon confirmation of such risk, the competent Authority shall issue a notice, in writing, to the owner or occupier of the building or premises, as the case may be, directing removal or safe relocation of such goods or materials to a designated place of safety, within the period specified in the notice.

(3) Upon failure to comply with the notice issued under sub rule (2) above or the provisions of section 11, the competent Authority shall, within a period not exceeding seven (7) days, initiate necessary proceedings to ensure the removal of such fire-prone materials.

(4) Where any object or goods involving risk of fire are required to be inspected, seized, detained or removed, the following procedure shall be adhered to,-

(a) a notice of inspection shall be issued by the competent Authority and such inspection shall be conducted jointly by the fire officer in-charge and officer-in-charge of the local police station;

(b) upon verification of the inadequacy of fire safety measures and imminent threat of fire or explosion posed by the goods or materials, the competent Authority may direct any person in possession or occupation of the building or premises, or any part thereof, to vacate the premises forthwith;

(c) an inventory (*Panchnama*) of the hazardous goods or materials shall be prepared and duly witnessed as required. The goods shall, thereafter, be removed or

relocated from the building or premises in a safe and secure manner, considering the nature and risk associated with the objects.

CHAPTER IX
QUALIFIED AGENCY

48. Application and grant of licence to act as a qualified agency.-

(1) No person or an association of persons shall be eligible to apply for grant of license to act as a qualified agency, unless he possesses, technical specialization in the field of Fire/ Civil/ Mechanical/ Electrical Engineering/ Technology/ Industrial Safety/ Disaster Management or Chemical Science, from a recognized University with minimum of 3 years of experience in the field of Fire Prevention and Life Safety, Urban Planning and Management or such other domain knowledge, as the State Government may notify.

(2) A person or an association of persons intending to act as a qualified agency shall submit an application through the designated online portal, which shall be accompanied by a licence fee of ₹10,000/- (Rupees Ten Thousand Only) or such fee, as may be revised by the State Government, from time to time.

(3)The competent Authority shall, upon verification of the credentials and documents submitted by the applicant qualified agency, forward the application along with his

reasons for recommendation or non-recommendation, to the Director or any officer authorised by him.

(4) The Director or any officer authorised by him shall, upon due consideration of the applicant's qualifications, experience, and eligibility criteria, decide on the empanelment of the applicant as a Qualified Agency and if found suitable, issue a licence through the official online portal, subject to the following conditions, namely:-

(a) the licence shall be non-transferable under any circumstances;

(b) any change in the constitution, composition or control of the qualified agency, including but not limited to changes in partners, directors, members or the registered address, shall be promptly reported to the Licensing Authority.

(5) The licence issued under sub-rule (2) above, shall be valid for a period of five years from the date of its issuance.

49. Functions of qualified agencies.-

(1) In addition to the functions, as may notified by the State Government, from time to time, the qualified agency shall perform the following functions, namely:-

(a) **Adherence to standards.-** The qualified agency shall be responsible for ensuring that fire prevention and life safety systems are in accordance with the relevant Standards and technical specifications.

(b) **Accountability for deficiencies.-** In case of any defect, deficiency or malfunction in the installed fire protection system, which is attributable to faulty design, material,

workmanship or installation, the qualified agency shall be held liable for all consequences arising therefrom, including appropriate action, as per the applicable laws and shall be responsible to promptly notify the concerned competent Authority of any material deviation, non-conformance or inability to meet fire safety requirements during execution of work.

(c) **Documentation and certification.**- The qualified agency shall maintain complete documentation of each project undertaken and shall furnish a work completion certificate in the prescribed form, declaring compliance with applicable codes and standards.

(d) **Annual maintenance liability.-** Where engaged for maintenance, the qualified agency shall be liable to conduct periodic inspections, functional checks and repairs to maintain the fire protection systems in optimal working condition.

(e) **Training responsibility.**- Upon completion of installation, the qualified agency shall provide basic operational training and demonstration of fire protection systems to the building management or designated personnel.

50. Grounds for suspension, cancellation or debarment of qualified agency.-

(1) The licence granted to a qualified agency may be,—

(a) suspended for a period not exceeding one year;

(b) cancelled; or

(c) permanently debarred from further operations,

by the Director or any officer authorised by him, upon receipt of a written complaint regarding any anomaly or deficiency in,—

(i) the installation of fire prevention, life safety or fire protection system measures; or

(ii) the issuance of the certificate.

(2) Where it is found that any qualified agency has,—

(a) contravened any provision of the Act or these rules;

(b) failed to comply with the terms and conditions of the licence; or

(c) become unfit to act as a qualified agency, by reason of incompetency, misconduct or other serious grounds,

the Director or any officer authorised by him may initiate proceedings for,—

(i) suspension or cancellation of the licence; or

(ii) imposition of penalty under section 18 of the Act.

(3) In such cases, a notice shall be issued, requiring the qualified agency to show cause within the prescribed time, as to why such action should not be taken.

Any qualified agency aggrieved by an order of suspension or cancellation of the license or an order of debarment, may prefer an appeal in accordance with the provisions of rule 52.

51. Revocation of suspension.-

(1) After the lapse of the suspension period, the qualified agency may apply for revocation of the order.

(2) The Director or any officer authorised by him may revoke the suspension, subject to satisfactory compliance and removal of defects.

CHAPTER-X

APPEALS

52. Appeals.-

(1) Subject to the provisions of section 25 of the Act, any individual, association of individuals or any authority aggrieved by an order passed under the Act or these rules shall have the right to appeal before the designated appellate authorities, as enumerated in the table below,-

S No.	Appeal against an Order of	Appellate Authority
1.	Fire Officer	Competent Authority
2.	District Collector	Divisional Commissioner
3.	Municipal Commissioner	Director
4.	Director	Secretary-in-Charge, Urban Administration and Development Department.

(2) Every appeal filed under this Chapter must be accompanied by,-

(i) a certified copy of the impugned order;

(ii) a statement of grounds for appeal; and

(iii) a fee to be determined by the State Government, drawn in favour of the account dedicated for collection of the fire tax.

(3) The Appellate Authority shall conduct such proceedings, as it deems necessary and dispose of the appeal through a reasoned order, within thirty (30) days from the date of its receipt or within such extended period, not exceeding a total

of sixty (60) days from the date of filing thereof, as the case may be.

(4) The Authority, which made the order, on which the appeal was preferred, shall be duty-bound to implement and give effect to the directions issued by the Appellate Authority.

CHAPTER-XI
LEVY OF FIRE TAX

53. Levy and recovery of fire tax.-

(1) A fire tax may be levied on all lands and buildings that are subject to property tax, at the rate of not less than two (2) percent of property tax or at such other rate, as may be determined by the State Government, from time to time.

(2) For removal of doubts, it is made clear that all the residential properties that are exempted from the levy of property tax are also exempted from the levy of fire tax.

(3) The amount so levied shall be recoverable as an arrear of land revenue and all provisions relating to the recovery of such arrears shall apply *mutatis mutandis* to the recovery of the fire tax.

CHAPTER-XII
PERSONNEL

54. Qualifications for appointment of fire officer of different ranks and other terms and conditions of service.- The qualifications for appointment, along with the terms and

conditions of service, in respect of fire officers of various ranks, within the Madhya Pradesh Fire and Emergency Service shall be governed by the applicable service rules made thereunder.

55. Personnel of Fire and Emergency Service deemed to always be on duty except when on leave.- Every personnel of the Fire and Emergency Service shall, for all purposes of the Act and the rules made thereunder, be deemed to be always on duty except when on leave.

CHAPTER-XIII
FEES AND CHARGES

56. Charges for Fire and Emergency Services.-

(1) In all other cases not covered under sub-rule (2) below, service charges may be levied at such rates, as may be prescribed by the State Government.

(2) No fees shall be levied for fire and emergency services rendered in the following cases:

(i) Incidents occurring at State or Central Government hospitals or nursing homes;

(ii) State or Central Government offices and buildings;

(iii) Educational and training institutions operated by the State or Central Government or recognized NGOs;

(iv) Rescues involving animals, birds, or human life;

(v) Emergencies arising from natural disasters, terrorist incidents, civil unrest, or riots;

(vi) Assistance rendered to the Indian Army, Police, or Paramilitary Forces;

(3)The fees prescribed as per sub-rule (1) shall be subject to an annual escalation of five percent (5%), effective from the 1st day of April of each year.

57. Standby duty for Fire protection and Charges.-

The Urban Local Bodies or any equivalent body, as the case may be, shall levy standby duty charges for such premises where Fire and Emergency Service has been called to render their services to prevent or effectively provide fire safety.

CHAPTER-XIV
MISCELLANEOUS

58. Calling of reports and statements.-

(1)The State Government may call for reports and statements from any Department on any subject connected with the functions conferred on the State Government by or under the Act and these rules, including fire prevention, life safety and any emergency services.

(2)Where any reports or statements are called for under this rule, the concerned Department shall furnish the same, within the time specified by the State Government.

59. District fire and emergency Committee.-

(1)The following Committee, to be called the District Fire and Emergency Committee, shall be constituted for facilitating inter-departmental co-ordination, expeditious resolution of special matters, and management of ancillary matters:-

District Collector	Chairperson
Superintendent of Police	Member
Chief Executive Officer, Zila Panchayat	Member
Project Officer, District Urban Development Agency	Member - Secretary
Municipal Commissioner/Chief Municipal Officer	Member
Chief Medical Health Officer	Member
Any person nominated by the Director	Member

(2) The Chairperson may, nominate such other member to the committee as it deems necessary.

(3) The Committee shall meet at least quarterly in a year.

(4) Without prejudice to the generality of the provisions of sub-rule (1), the Committee shall perform the following functions,-

(a) prepare a fire and emergency plan for the District;

(b) co-ordinate and monitor implementation of the Fire and Emergency Plan;

(c) ensure that the areas in the district vulnerable to fire accidents and disasters are identified and measures for the prevention and the mitigation of its effects are undertaken by the departments of the Government at the district level;

(d) ensure that the guidelines for prevention of fire accidents and disasters, mitigation of its effects, preparedness and response measures as laid down by

the National Authority and the State Authority are followed by all departments of the Government at the district level;

(e) give directions to different authorities at the district level to take such other measures for the prevention or mitigation of disasters as may be necessary; and

(f) perform such other functions, as the State Government may assign to it or as it deems necessary.

60. Budget.- The Director shall prepare an annual estimated budget for managing all affairs of the Fire and Emergency Service.

61. Reservation for Agniveers.- Reservations for Agniveers shall be made, as per the circulars issued by the State Government, from time to time.

CLASSIFICATION OF BUILDINGS FOR APPOINMENT OF FIRE SAFETY SUPERVISOR

(see section 16 and rule 15)

Fire Safety Supervisors shall be appointed for different class of buildings as listed below:-

Class of Buildings	Fire Safety Supervisor
(1)	(2)
1. Residential Buildings of 45 meters and above in height; 2. Hotels, Resorts, Guest Houses, Dharamshala etc. with 50 rooms or more; Hotels, Resorts, Guest Houses, etc. with 4 Star and above category; 3. Multi-storied non-residential buildings of 24 meters and above in height; 4. Educational Buildings of 15 meters and above in height; 5. Hospital and nursing homes with more than 100 beds; 6. All assembly buildings of 15 meters and above in height; 7. Underground shopping complexes, including the basement with total buildup area of more than 1000 Sqm; 8. Cinema Houses/Halls with seating capacity of more than 250 persons; 9. All Cinema Houses/Halls with commercial complex having covered area more than 1000 Sqm; 10. Open stadia with seating capacity of more than 10,000 persons and indoor stadia with seating capacity of more than 2,000 persons; 11. Public, semi-public, private etc. buildings like large surface and sub-surface railway stations, metro stations or mass rapid transit stations, Inter-state bus terminals, amusement parks and other similar buildings. 12. Mercantile/Business Buildings of 24 meters and above in height;	Fire Safety Supervisor with sizeable supporting staff
13. Low Hazard industries of total covered area above 10000 Sqm, Moderate Hazard industries of total covered area above 5000 Sqm, High Hazard industries of total covered area above 1000 Sqm; 14. Storage occupancy buildings of total covered area of 10,000 Sqm and above. 15. Hazardous buildings having total covered area of 2500 Sqm or more; 16. Large Oil and Natural Gas Installations such as refineries, LPG bottling plants and other similar facilities;	

SCHEDULE

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1. SCOPE

1.1. This Schedule covers the requirements for fire prevention, life safety in relation to fire, and fire protection of buildings.

1.2. The provisions of this Schedule shall apply where a building is altered to such an extent or where there is a change in the occupancy classification of the building, that it falls within a category requiring a Fire No Objection Certificate.

2. FIRE PREVENTION PROVISIONS

2.1. CLASSIFICATION OF BUILDINGS BASED ON OCCUPANCY

2.1.1. General Classification

All buildings, whether existing or hereafter erected, should be classified according to 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
Group K: Mixed use

2.1.1.1. Minor occupancy

This is purely incidental to operations in a main occupancy, which should be considered as part of the main occupancy and should be classified under the relevant group for the main occupancy. Minor occupancy should not exceed 30 percent of the floor area. When the area exceeds 30 percent, it should be categorized as mixed occupancy (2.1.11).

2.1.1.2. Mixed occupancy

Where two or more types of occupancies intermingle in the same building, the entire building should be treated as mixed occupancy and the same should comply with 2.1.11.

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.

2.1.5. Group D: Assembly Buildings

These include any building where persons congregate or gather for amusement, recreation, social, religious, patriotic, civil, travel and similar purposes, for example, shopping malls, theatres/multiplexes, motion picture houses; assembly halls; auditoria; exhibition halls; museums; skating rinks; gymnasiums; restaurants/food courts; places of worship; dance halls; club rooms; passenger stations and terminals of air, surface and marine public transportation services; stadia; and underground and elevated railways.

2.1.6. Group E: Business Buildings

These include any building which is used for transaction of business, for keeping of accounts and records and similar purposes, professional establishments, service facilities, etc, city halls, town halls, courthouses and libraries are classified in this group so far as the principal function of these is transaction of public business and keeping of books and records. These occupancies also include laboratories, outpatient clinics, research establishments, libraries, test houses, electronic data processing centres, computer installations, information technology parks and call centres; telephone exchanges; broadcasting stations, T.V. stations, and air traffic control towers; and datacentres.

Buildings under Group E are further subdivided as follows:

a) **Subdivision E-I Business buildings (human occupied); and**
b) **Subdivision E-II Datacentres (machine environment).**

2.1.7. Group F Mercantile Buildings

These include any building which is used as shops, stores, market, for display and sale of merchandise, either wholesale or retail.

Mercantile buildings are further subdivided as follows:

a) **Subdivision F-I Shops, stores, departmental stores, markets; and**
b) **Subdivision F-II Underground shopping centres.**
c) **Hotels**
d) **Starred hotels —** These include the hotels duly approved by the concerned authorities as Five Star and above hotels.

2.1.8. Group G: Industrial Buildings

These include any building or structure, in which products or materials of all kinds and properties are fabricated, assembled, manufactured, or processed, for example, assembly plants, industrial laboratories, dry cleaning plants, power plants, generating units, pumping stations, fumigation chambers, laundries, buildings or structures in gas plants, refineries, dairies and saw-mills, etc. Buildings under Group G are further subdivided as follows:

a) **Subdivision G-I Buildings used for low hazard industries;**
b) **Subdivision G-II Buildings used for moderate hazard industries; and**
c) **Subdivision G-III Buildings used for high hazard industries.**

The hazard of occupancy, for the purpose of this Schedule, should be the relative danger o :he start and spread of fire, the danger of smoke or gases generated, the danger of explosion or other occurrences potentially endangering the lives and safety of the occupants of the buildings. Hazard of occupancy should be determined by the Authority on the basis of the fire loads of the contents, and the processes or operations conducted in the building, provided, however, that where the combustibility of the material, the flame spread rating of the interior finish or other features of the building or structure are such as to involve a hazard greater than the occupancy hazard, the greater degree of hazard should govern the classification.

Where different degrees of hazard of occupancy exist in different parts of a building, the most hazardous of those should govern the classification for the purpose of this Schedule, except in cases where hazardous areas are segregated or protected as specified in this Schedule.

a) **Subdivision G-I —** This subdivision includes any building in which the contents are of such comparative low combustibility and the industrial processes or operations conducted therein are of such a nature that there is hardly any possibility for any self-propagating fire to occur and the only consequent danger to life and property may arise from panic, fumes or smoke, or fire from some external source;

b) **Subdivision G-II —** This subdivision includes any building in which the contents or industrial processes or operations conducted therein are liable to give rise to a fire which will burn with moderate rapidity or result in other hazardous situation and may give off a considerable volume of smoke, but from which neither toxic fumes nor explosions are to be feared in the event of fire; and

c) **Subdivision G-III —** This subdivision includes any building in which the contents or industrial processes or operations conducted therein are liable to give rise to a fire which will burn with extreme rapidity or result in other hazardous situation or from which poisonous fumes or explosions are to be feared in the event of a fire.

TABLE -1

BROAD CLASSIFICATION OF INDUSTRIAL OCCUPANCIES INTO DIFFERENT DEGREE OF FIRE HAZARD

G-I Low Hazard	G-II Moderate Hazard	G-III High Hazard
Abrasive Manufacturing Premises	Aluminium Factories	**SUB-CATEGORY (A)**
Aerated Water Factories	Atta and Cereal Grinding units	Aircraft Hangars units
Agarbatti Manufacturing	Auto Components (excluding plastics and foam components) manufacturing	Aluminium/Magnesium Powder Plants
Areca nut slicing and/or Betel nut Factories	Bakeries and Biscuit Factories	Auto Components (including Plastics and Foam Components)
Analytical and/or Quality Control Laboratories	Beedi Factories	Auto Mobiles and other Motor Vehicles powered by Lithium or Lithium-Ion Batteries manufacturing
Athletic Equipment Manufacturing	Bobbin Factories	Battery Charging/Battery Service Stations
Asbestos Steam Packing and Lagging Manufacturing	Bookbinders, Envelopes and Paper bag Manufacturing	Battery Manufacturing
Auto mobiles and other motor vehicles	Cable manufacturing	Bituminized Paper and/or Hessian Cloth/Tar Felt Manufacturing

Breweries	Camphor boiling facilities	Chemical Store (water reactive)
Brick Works	Candle Works	Cotton Waste Factories
Canning Factories	Carbon Paper/Typewriter Ribbon Manufacturing	Celluloid Goods Manufacturing
Cardamom Factories	Cardboard box manufacturing	Chemical Manufacturing using raw materials having flash points below 23 °C Chemical mfg <23°C flash point
Cement Factories and/or Asbestos or Concrete Products Manufacturing	Carpenters, Wood wool and Furniture Manufacturing	Cigarette Filter Manufacturing
Ceramic Factories and Crockery and Stoneware Pipe Manufacturing	Carpet and Durries Factories	Diesel Generator Room
Clay Works	Cashewnut Factories	Fireworks Manufacturing
Clocks & Watches Manufacturing	Chemical Manufacturing using raw materials having flash points above 23 ºC	Foam Plastics Manufacturing and/or Converting Plants
Coffee Curing Roasting and grinding Premises	Chemical Store (non-water reactive)	Godowns and Warehouses (storing combustible/flammable goods)
Condensed Milk Factories, Milk Pasteurizing Plant and Dairies	Cinema Films and T.V. Production Studios	Grass, Hay, Fodder and Bhoosa (chaff) Pressing Factories
Confectionery Manufacturing	Cigar & Cigarette factories	Hydrogenation rooms (involving Flammable Hydrogen)
Cooling Towers	Coal and/or Coke and/or Charcoal Ball and Briquettes Manufacturing	Industrial Gas Manufacturing (other than Inert/Halogenated Hydrocarbon Gases)
Electric Generating Houses (Hydroelectric)	Coir factories	Jute mills and jute presses
Incandescent and Fluorescent and TV Picture Tube Manufacturing	Coir Carpets, Rugs, Tobacco, Hides and Skin Presses	Linoleum Factories
Electro-plating Works	Cold storage premises	Lithium-Ion Battery Manufacturing Plants
Engineering Workshops	Cold Freezer Room	LPG Bottling Plants (Mini)
Fruits and Vegetables Dehydrating and Drying Factories	Collieries	Man-made Fibres (Acrylic fibres/yarn manufacturing)
Fruit Products and Condiment Factories	Conveyors	Match Factories
Garages	Cork products manufacturing	Metal or Tin Printers (where more than 50 percent of floor area is occupied as Engineering Workshop; this may be taken as Ordinary Hazard Risk)
Glass and Glass Fibre Manufacturing	Cotton Seed Cleaning or De-linting Factories	Oil Mills
Godowns and Warehouses storing non-combustible goods only	Distilleries	Oil Extraction Plants
Green houses	Dry Cleaning, Dyeing and Laundries	Oil Fire Boiler Room/ Oil Quenching Tank
Gold Thread/Gilding Factories	Duplicating/Stencill Paper Manufacturing	Oil Terminals/Depots handling flammable liquids having flash point of 23 °C and below
Gum and/or Glue and Gelatine Manufacturing	Electric substations/Distribution stations	Oil Transformer Room
Ice, Ice Candy, and Ice-cream Manufacturing	Electric Generating stations (other than Underground power houses)	Paints and Varnish Factories
Ink (excluding Printing Ink) Factories	Electric Lamps Manufacturing	Paint Booths

Mica Products Manufacturing	Electrical Appliances Manufacturing	Paint/Varnish Storage
Multiple block apartment buildings	Electrical/Motor Control Centre (MCC) Panel Rooms	Paper and Cardboard Mills having raw material yards
Open Large Atriums	Electronic Products Manufacturing	Piers, Wharfs and Jetties – Handling Extra Hazardous Materials
Pottery Works	Enamelware Factories	Printing Ink Manufacturing.
Poultry Farms	Filter and Wax paper Manufacturing	Rosin Lamp black and Turpentine Factories
QA/QC Laboratories	Flour Mills	Saw Mills
Salt Crushing Factories and Refineries	Food Processing establishments	Spray painting facilities
Stables	Garment Makers	Server room
Sugar Candy Manufacturing	Ghee Factories (other than vegetable)	Surgical Cotton Manufacturing
Tanneries/Leather Goods Manufacturers	Godowns and Warehouses (other than those under light and high hazard A categories)	Tanker Loading/Unloading Bay
Umbrella Assembling Factories	Grain and/or Seeds Disintegrating and/or Crushing Factories	Tarpaulin and Canvas Proofing Factories
Vermicelli Factories	Grease Manufacturing	Turpentine and Rosin Distilleries
Water Treatment/Filtration Plants and Water Pump Houses	Hosiery, Lace, Embroidery and Thread Factories	Tyre Retreading and Resoling Factories
Zinc/Copper Factories	Incandescent Gas Mantle Manufacturing	Tunnel Protection
	Indoor Dry Transformer Room	UPS Room with batteries
	Industrial Gas Manufacturing (Inert/halogenated hydrocarbon gases)	Battery Room with Lithium-ion Batteries
	Kitchen with any type of fuel (Live cooking)	**SUB-CATEGORY (B)**
	MRI/scanning room	Ammonia and Urea Synthesis Plants
	Man-made Yarn/Fibre Manufacturing (other than acrylic fibres/yarn Manufacturing)	Benzene/ Xylene/ Toluene Tanks
	Manure and Fertilizer Works (Blending, Mixing, and granulating)	CNG Compressing and Bottling Plants
	Mattress and Pillow Making	Coal based methane plants
	Mineral Oil Blending and Processing	LPG bullets
	Multiple block business buildings	Explosive Factories
	Multiple block star hotel Buildings	Oil Storage (above ground)
	Musical Instruments Manufacturing	Outdoor Oil Transformer Room
	Network/electrical room	
	Oil and Leather Cloth Factories	
	Oil Terminals/Depots other than those categorized under High hazard A	**NOTE** — In case of complexes having separate plants having varying degrees of hazard, authority having jurisdiction should be consulted to decide on level of protection to be provided.
	Open storage of flammable liquids in drums, cans, etc	
	Operation Theatre Rooms	
	Optical Goods facilities	

	Oxygen Plants	
	Paper and Cardboard Mills without Raw Material Yards	
	Pharmaceuticals	
	Piers, Wharves, Jetties and Dockyards other than those categorized under High hazard A	
	Plastic Goods Manufacturing	
	Plywood/Wood Veneering Factories	
	Printing Press Premises	
	Pulverising and Crushing Mills	
	Rice Mills	
	Rope Works	
	Rubber Goods Manufacturing	
	Rubber Tyres and Tubes Manufacturing	
	Semiconductors Manufacturing	
	Sulphur Storage	
	Sugar Factories and Refineries	
	Shellac Factories	
	Silk Filatures	
	Soaps and Glycerine Factories	
	Solar Cells and Modules manufacturing	
	Sponge Iron Steel Plants (Gas Based)	
	Starch Factories	
	Tea Factories	
	Textile Mills	
	Tobacco (Chewing) and Pan-Masala Making facilities	
	Tobacco Grinding and Crushing	
	Tobacco Redrying Factories	
	UPS Room without batteries	
	Woollen Mills	

NOTES

1. Any occupancy that is not covered in this table should be classified in the most appropriate class which resembles the proposed occupancy.
2. For classification of industries based on 'chemical hazard', pollution, etc, the respective state/central guidelines/documents/rules may be referred.

2.1.9. Group H: Storage Buildings

These include any building primarily for the storage or sheltering (including servicing, processing or repairs incidental to storage) of goods, ware or merchandise (except those that involve highly combustible or explosive products or materials), vehicles or animals, for example, warehouses, cold storages, freight depots, transit sheds, storehouses, truck and marine terminals, garages, hangars, grain elevators, barns and stables. Storage properties are characterized by the presence of relatively small number of persons in proportion to the area. Any new use which increases the number of occupants to a figure comparable with other classes of occupancy should change the classification of the building to that of the new use,

for example, hangars used for assembly purposes, warehouses used for office purpc ɔs, garage buildings used for manufacturing.

2.1.10. Group J: Hazardous Buildings

These include any building which is used for the storage, handling, manufacture or processing of highly combustible or explosive materials or products which are liable to burn with extreme rapidity and/or which may produce poisonous fumes or explosions for storage, handling, manufacturing or processing which involve highly corrosive, toxic or noxious alkalis, acids or other liquids or chemicals producing flame, fumes and explosive, poisonous, irritant or corrosive gases; and for the storage, handling or processing of any material producing explosive mixtures of dust which result in the division of matter into fine particles subject to spontaneous ignition. Examples of buildings in this class are those buildings which are used for,

a) storage, under pressure of more than 0.1 N/mm2 and in quantities exceeding 70 m3, of acetylene, hydrogen, illuminating and natural gases, ammonia, chlorine, phosgene, sulphur dioxide, carbon dioxide, methyl oxide and all gases subject to explosion, fume or toxic hazard, cryogenic gases, etc;
b) storage and handling of hazardous and highly flammable liquids, liquefiable gases like LPG, rocket propellants, etc;
c) storage and handling of hazardous and highly flammable or explosive materials (other than liquids); and
d) manufacture of artificial flowers, synthetic leather, ammunition, explosives, and fireworks.

NOTE — A list of hazardous substances giving quantities, for which or exceeding which owners handling such substances are required to be covered under The Public Liability Insurance Act, 1991, has been notified under the 'Rules on Emergency Planning, Preparedness and Response for Chemical Accidents' by the Government of India, Ministry of Environment and Forests Notification No. G.S.R. 347(E) dated 01 August 1996 or as amended from time to time.

2.1.11. Group K: Mixed Occupancy

2.1.11.1. These include any building having multiple occupancy where the occupancies are intermingled. The following table guides on the possible mixing of occupancies (two or more occupancies may be mixed) in a building.

TABLE-2

FIRE RESISTANCE RATING FOR THE SEPARATION BETWEEN ANY TWO OCCUPANCIES IN MINUTES

Sl. No.	Occupancy to be Mixed with	Minimum Required Fire Resistance Rating for the Separation between Any Two Occupancies in minutes										
								Industrial				
		Residential	Educational	Institutional	Assembly	Business	Mercantile	Low (G-1)	Moderate (G-2)	High (G-3)	Storage	Hazardous
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	**Residential**	-	120	120	120	120	120	120	NP	NP	NP	NP
2	**Educational**	120	-	120	120	120	120	NP	NP	NP	NP	NP
3	**Institutional**	120	120	-	120	120	120	NP	NP	NP	NP	NP
4	**Assembly**	120	120	120	-	120	120	120	120	NP	NP	NP
5	**Business**	120	120	120	120	-	120	120	120	240	NP	NP
6	**Mercantile**	120	120	120	120	120	-	120	120	NP	120	NP
7	**Industrial – Low (G-1)**	120	NP	NP	120	120	120	-	120	240	120	NP
8	**Industrial – Moderate (G-2)**	NP	NP	NP	120	120	120	120	-	240	180	240
9	**Industrial – High (G-3)**	NP	NP	NP	NP	NP	NP	240	240	-	240	240
10	**Storage**	NP	NP	NP	NP	120	120	120	180	240	-	240
11	**Hazardous**	NP	NP	NP	NP	NP	NP	NP	240	240	240	-
NP – Not permitted, being highly dangerous/vulnerable.												

2.1.11.2. For mixed occupancy building typology as above, if these co-exist in a building (such as large retail occupancy and business occupancy), in so far as fire protection is concerned, the entire building should be governed by the most restrictive provisions of this Schedule among those applicable for individual occupancies. However, the exits can be shared between mixed occupancies provided its aggregate provision meets the requirement of the mixed occupancy and should be permitted if such exits are with unrestricted egress of the occupants based on the business operational hours of the occupancies sharing such exits. If such unrestricted egress of the mixed-use occupancy is not planned, each occupancy should be provided with its independent exits.

Exits in such mixed occupancy should be so arranged as to ensure that means of egress is not decreased in the direction of egress travel.

Further, in such mixed occupancies, the occupancies are also required to be separated (horizontally and/or vertically as the case may be) by fire resistance rating, see 2.1.11.1 (TABLE-2).

2.1.12. Where change in the occupancy of any building places it in a different group or in a diffe nt subdivision of the same group, such building should be made to comply with the requirements of this Schedule for the new group or its subdivision.

2.1.13. Where the new occupancy of a building is less hazardous, based on life and fire risk, than its existing occupancy, it should not be necessary to conform to the requirements of this Schedule for the new group or its subdivision.

2.1.14. A certificate of occupancy should be necessary, before any change is effected in the character of occupancy of any building.

2.2. Temporary Buildings or Structures

2.2.1. Temporary buildings and structures may be permitted according to the purpose for which these are to be used, by Fire Safety Certificate from the Competent Authority for a period specified therein and subject to such conditions as may be imposed in the Fire Safety Certificate.

2.2.2. Such buildings and temporary structures should be completely removed on the expiry of the period specified in the Fire Safety Certificate.

2.2.3. Adequate fire precautionary measures in the construction of temporary structures and Pandals should be taken in accordance with good practice [F(4)].

2.3. Existing Buildings

The existing buildings need not be required to comply with the requirements of this part unless these are altered, or in the opinion of the Local Body, such building constitutes a hazard to the safety of the adjacent property or to the occupants of the building itself or is an unsafe building. In the event of alteration, it should be necessary to obtain permission of the Authority for such alteration consistent with fire hazard.

Alterations/modifications/renovations may be accomplished so as to ensure conformity with all the safety requirements of the new buildings. Such alterations should not in any way bring down level of fire and life safety below that which existed earlier. Any addition or alterations or construction of cubicles or partitioning (that will effect/increase the travel distance requirement), changes in the typology of the occupancy or densification of an existing occupancy for floor area exceeding 1000 m2 should be with the approval of local fire authority.

2.4. Types of Construction

2.4.1. The design of any building and the type of materials used in its construction are important factors in making the building resistant to a complete burn-out and in preventing the rapid spread of fire, smoke, or fumes, which may otherwise contribute to the loss of lives and property. The fire resistance of a building or its structural and non-structural elements is expressed in minutes against a specified fire load which is expressed in kcal/m2, and against a certain intensity of fire. The fire-resistance test for structural element should be done in accordance with accepted standards [F(2)]. For the purpose of this Schedule, the types of construction according to fire resistance should be classified into four categories, namely, **Type 1 Construction, Type 2 Construction, Type 3 Construction and Type 4 Construction**. The minimum fire resistance ratings of structural and non-structural members for various types of construction is given in Table 3. Non-combustible materials should be used for construction of buildings, and the internal walls of staircase enclosures should be of brick work or reinforced

concrete or any other material of construction with minimum of 120 minutes rating. The walls for the chimney should be of Type 1 or Type 2 Construction depending on whether the flue gas temperature is above 200 °C or less, respectively.

2.4.2. It is required that a structural and/or non-structural element/component to have the requisite fire resistance rating as per Table 3. The fire resistance rating for the structural and non-structural elements are based on guidelines as per approved and accepted standards. The fire rating should be validated and certified with a view to meeting the requirements of Table 3.

2.4.3. Load bearing steel beams and columns of buildings having total covered area of 500 m2 and above need to be protected against failure/collapse of structure in case of fire. This could be achieved by use of appropriate methodology using suitable fire resistance rated materials along with suppression system.

2.4.4. The false ceiling, including all fixtures used for its suspension, need to be of non-combustible material. To provide adequate fire resistance to the ceiling in order to prevent spread of fire across ceiling.

2.5. General Requirements of All Individual Occupancies

2.5.1. General

All buildings should satisfy certain requirements, which contribute, individually and collectively, to the safety of life from fire, smoke, fumes, and panic arising from these or similar causes. There are, however, certain general principles and common requirements, which are applicable to all or most of the occupancies.

TABLE 3

FIRE RESISTANCE RATINGS OF STRUCTURAL AND NON-STRUCTURAL ELEMENTS (IN MINUTES)

Si No.	Structural/Non-Structural Element	Fire Resistance Ratings (min) for Type of Construction			
		Type 1	Type 2	Type 3	Type 4
(1)	(2)	(3)	(4)	(5)	(6)
1.	Exterior walls:				
	a) Fire separation less than 3.7 m:				
	1) Bearing	240	120	120	60
	2) Non-bearing	120	90	60	60
	b) Fire separation of 3.7 m or more but less than 9 m:				
	1) Bearing	240	120	120	60
	2) Non-bearing	90	60	60	60
	c) Fire separation of 9 m or more:				
	1) Bearing	240	120	120	60
	2) Non-bearing	60	60	60	60
2.	Fire separation assemblies (like fire check doors)	120	120	120	120
3.	Fire enclosures of exits	120	120	120	120
4.	Shafts for services, lift hoistway and refuse chutes	120	120	120	120

5.	Vertical separation between adjacent tenant spaces	60	60	60	60
6.	Dwelling unit separation:				
	a) Load bearing	120	120	60	60
	b) Non-load bearing	60	60	30	30
7.	Interior bearing walls, bearing partitions, columns, beams, girders, trusses (other than roof trusses) and framing				
	a) Supporting more than one floor	240	120	120	120
	b) Supporting one floor only	180	90	60	60
	c) Supporting a roof only	180	90	60	60
8.	Walls supporting structural members	180	90	60	60
9.	Floor construction	120	90	60	60
10.	Roof construction:				
	a) 5 m or less in height to lowest member	120	90	60	60
	b) More than 5 m but less than 6.7 m in height to lowest member	60	60	60	60
	c) 6.7 m or more in height to lowest member	0 60*	0 60*	0 60*	0 60*
* 60 minutes should be adopted when associated building services/cables are running at higher levels and supported from/near the roof, like in airports.					

2.5.1.1. Refuse chutes

Refuse chutes, if any provided in a building, should have opening at least 1 m above roof level for venting purpose and they should have an enclosure wall of non-combustible material with fire resistance of not less than 120 minutes. They should not be located within the staircase enclosure or service shafts, or air conditioning shafts. Refuse chutes inspection panel and doors should be tight fitting with 60 minutes fire resistance. Sprinkler protection system should be provided for the refuse chutes. Refuse chutes should be at least 3 m away from exits.

2.5.1.2. Vertical opening

Every vertical opening between the floors of a building should be suitably enclosed or protected, as necessary, to provide the following:

c) Reasonable safety to the occupants while using the means of egress by preventing spread of fire, smoke, or fumes through vertical openings from floor to floor to allow occupants to complete their use of the means of egress. Further it should be ensured to provide a clear height of 2100 mm in the exit access.

d) Limitation of damage to the building and its contents.

2.5.2. Electrical Installation

2.5.2.1. In general, it is desirable that the wiring and cabling are with flame retardant property. Medium and low voltage wiring running in shafts, and within false ceiling should run in metal conduit. Any 230 V wiring for lighting or other services, above false ceiling, should have 660 V grade insulation.

The electric distribution cables/wiring should be laid in a separate shaft. The shaft should be sealed at every floor with fire stop materials, see accepted standard [F(34)] having the same fire resistance as that of the floor. High, medium, and low voltage wiring running in shaft and in

false ceiling should run in separate shaft/conduits. Water mains, gas pipes, telephone lines, intercom lines or any other service line should not be laid in the duct for electrical cables; use of bus ducts/solid rising mains instead of cables is preferred. All metallic items like steel structural members, etc, should be bonded properly to the earthing system.

2.5.2.2. Emergency power for fire and life safety systems

Emergency power supplying distribution system for critical requirement for functioning of fire and life safety system and equipment should be planned for efficient and reliable power and control supply to the following systems and equipment where provided:

d) Fire pumps;
e) Pressurization and smoke venting; including its ancillary systems such as dampers and actuators;
f) Fireman's lifts (including all lifts);
g) Exit signage lighting;
h) Emergency lighting;
i) Fire alarm system;
j) Public address (PA) system (relating to emergency voice evacuation and annunciation);
k) Magnetic door hold open devices; and
l) Lighting in fire command centre and security room.

Power supply to these systems and equipment should be from normal and emergency (standby generator) power sources with changeover facility. If power supply is from HV source and HV generation, the transformer should be planned in standby capacity to ensure continuity of power to such systems. Wherever transformers are installed at higher levels in buildings and backup DG sets are of higher voltage rating, then dual redundant cables should be taken to all transformers. The generator should be capable of taking the starting current of all the fire and life safety systems and equipment as above. Where a parallel HV/LV supply from a separate substation fed from a different grid is provided with an appropriate transformer for emergency, the provision of generator may be waived in consultation with the Authority.

The power supply to the panel/distribution board of these fire and life safety systems should be through fire proof enclosures (tested and certified) or fire survival cables or through alternate route in the adjoining fire compartment to ensure supply of power is reliable to these systems and equipment. It should be ensured that the cabling from the adjoining fire compartment is protected within the compartment of vulnerability. The location of the panel/
distribution board feeding the fire and life safety system should be in fire safe zone ensuring supply of power to these systems.

Circuits of such emergency system should be protected at origin by an automatic circuit breaker with its no-volt coil removed. Master switches controlling essential service circuits should be clearly labelled.

Cables for fire alarm and PA system should be laid in metal conduits or armoured to provide physical segregation from the power cables.

2.5.2.3. Substation/Transformers

Areas in substation should not be used as storage/dump areas or for other utility purposes other than those required for the functioning of the substation. The substation area should be adequately ventilated. An independent, ventilated or air conditioned electrical substation and LT panel room/area should be provided on the ground level or first basement. They should be provided with access from outside (or through exit passageway accessible from outside). The electrical substation and LT panel room/area should be provided with fire resistant walls and doors of fire resistance of not less than 120 minutes.

If the Electricity Provider agree to provide meters on upper floors, the Electricity Providers' cables should be segregated from consumers' cables by providing a partition in the shaft. Meter rooms on upper floors should not open into staircase enclosures and should be ventilated directly to open air outside or in electrical room of 120 minutes fire resistant walls.

Electrical MV main distribution panel and lift panels should be provided with CO2/inert gas flooding system for all panel compartments with a cylinder located beside the panel.

2.5.2.3.1. Oil filled substation

A substation or a switch-station with oil filled equipment should be limited to be installed in utility building or in outdoor location. Such substation/utility building should be at least 6 m away (or as per local requirements/actual width of fire driveway) from the adjoining building(s). Substation equipment (exceeding aggregate oil capacity of 2000 litre) in utility building should have fire rated baffle walls of 240 minutes rating constructed between such equipment, raised to at least 600 mm above the height of the equipment (including height of oil conservators/explosion vents) and exceeding 300 mm on each side of the equipment. All transformers where capacity exceeds 10 MVA should be protected by high velocity water spray systems/ high pressure water mist system. In addition, nitrogen injection systems may also be provided where applicable.

2.5.2.3.2. Dry type substation

Transformers located inside a building should be of dry type and all substation/switch room walls, ceiling, floor, opening including doors should have a fire resistance rating of 120 minutes. Access to the substation should be provided from the nearest fire exit/exit staircase for the purpose of electrical isolation.

2.5.2.4. Standby supply

Diesel generator set(s) should not be installed at any floor other than ground/first basement. If the same are installed indoors, proper ventilation and exhaust should be planned. The DG set room should be separated by 120 minutes fire resistance rated walls and doors.

The oil tank for the DG sets (if not in the base of the DG) should be provided with a dyked enclosure having a volumetric capacity of at least 10 percent more than the volume of the oil tank. The enclosure should be filled with sand for a height of 300 mm. See table 9 for specific fire protection guidelines. For detailed information regarding fire safety requirements for hazardous petroleum products, reference may be made to The Petroleum Act, 1934 and the Rules framed thereunder.

2.5.2.5. Lightning protection of buildings

Routing of down conductors (insulated or uninsulated) of lightning protection through electrical or other service shafts are not allowed as it can create fire and explosion during lightning.

2.5.3. Escape Lighting and Exit Signage

Exit access, exits, and exit discharge should be properly identified, with adequate lighting maintained in the elements of the egress systems so that all occupants should be able to leave the facility safely.

2.5.3.1. Lighting

a) The exit, exit access and exit discharge systems should be illuminated continuously. The floors of the means of egress should be illuminated at all points, including angles and intersections, in corridors and passageways, stairwells, landings of stairwells and fire exit;

b) Emergency lighting should be powered from a source independent of that supplying the normal lighting;

c) Escape lighting should be capable of,

1) indicating clearly and unambiguously the escape routes;

2) providing adequate illumination along such routes to allow safe movement of persons towards and through the fire exits; and

3) ensuring that fire alarm call points and firefighting equipment provided along the escape routes can be readily located.

d) The horizontal luminance at floor level on the centreline of an escape route should not be less than 10 lumen/m2. In addition, for escape routes up to 2 m wide, 50 percent of the route width should be lit to a minimum of 5 lumen/m2. In auditoriums, theatres, concert halls and such other places of assembly, the illumination of floor exit/access may be reduced during period of performances to values not less than 2 lux;

e) Required illumination should be arranged such that the failure of any single lighting unit, such as the burning out of one luminaire, will not leave any area in darkness and does not impede the functioning of the system further;

f) The emergency lighting should be provided to be put on within 5 second of the failure of the normal lighting supply. Also, emergency lighting should be able to maintain the required illumination level for a period of not less than 90 minutes in the event of failure of the normal lighting even for smaller premises;

g) Battery pack emergency lighting, because of its limited duration and reliability, should not be allowed to be used in lieu of a diesel engine driven emergency power supply;

h) Escape lighting luminaires should be sited to cover the following locations:

1) Near each intersection of corridors,

2) At exits and at each exit door,

3) Near each change of direction in the escape route,

4) Near each staircase so that each flight of stairs receives direct light,

5) Near any other change of floor level,

6) Outside each final exit and close to it,

7) Near each fire alarm call point,

8) Near firefighting equipment, and

9) To illuminate exit and safety signs as required by the enforcing authority.

NOTE — For the purpose of this clause 'near' is normally considered to be within 2m measured horizontally.

at all times.

i) The luminaires should be mounted as low as possible, but at least 2 m above the floor level; and

j) Signs are required at all exits, emergency exits and escape routes, which should comply with the graphic requirements of the relevant Indian Standards.

2.5.3.2. Exit passageway and staircase lighting should also be connected to alternative supply. The alternative source of supply may be provided by battery continuously trickle charged from the electric mains. Suitable arrangements should 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 should be installed in the service room for terminating the stand-by supply.

2.5.3.3. The emergency lighting system should be well maintained to ensure their perfect serviceability at all times.

2.5.3.4. Exit signage

Where exit access is provided through corridors/paths, the occupants should be able to easily identify the way to exits. Exit signs should be provided such that no point in an exit access is more than 30 m from a visible exit directional sign. An exit sign indicating the direction to an exit should be provided at all changes in direction.

Exits should be clearly visible and the route to reach the exits should be clearly marked and signs posted to guide the occupants of the floor concerned. Signs should be illuminated and wired to an independent electrical circuit on an alternative source of supply. The sizes and colours of the exit signs should be in accordance with good practice [F(7)]. The colour of the exit signs should be green.

NOTE — This provision shall not apply to A-II and A-IV occupancies less than 15 m in height.

The exit sign with arrow indicating the way to the escape route should be provided at a suitable height from the floor level on the wall and should be illuminated by electric light connected to corridor circuits. All exit way marking signs should be so installed that no mechanical damage should occur to them due to moving of furniture or other heavy equipment. Further, all landings of floor should have floor indicating boards prominently indicating the number of the floor. Photo luminescent markings should be pasted at internal hydrant boxes.

2.5.4. Air Conditioning, Ventilation and Smoke Control

2.5.4.1. Air conditioning and ventilating systems should be so installed and maintained as to minimize the danger of spread of fire, smoke, or fumes from one floor to another or from outside to any occupied building or structure. Many high-rise buildings integrate smoke management systems into their conventional HVAC systems. In such installation, it requires special design considerations, including safe and adequate controls, acceptable and documented testing, and regular maintenance systems. Wherever batteries are provided, the same should be

segregated by 120 minutes fire rated construction. Ventilation to the room should be provided as per manufacturer's instructions.

2.5.4.2. Air handling unit

2.5.4.2.1. From fire safety point of view, separate air handling units (AHU) for each floor should be provided so as to avoid the hazards arising from spread of fire and smoke through the air conditioning ducts. The air ducts should be separate from each AHU to its floor and in no way should interconnect with the duct of any other floor. Within a floor it would be desirable to have separate air handling unit provided for each compartment. Air handling unit should be provided with effective means for preventing circulation of smoke through the system in the case of a fire in air filters or from other sources drawn into the system, and should have smoke sensitive devices for actuation in accordance with the accepted standard [F (8)] and control.

2.5.4.2.2. Shafts or ducts, if penetrating multiple floors, should be of masonry construction with fire damper in connecting ductwork or should have fire rated ductwork with fire dampers at floor crossing. Alternatively, the duct and equipment may be installed in room having walls, doors and fire damper in duct exiting/entering the room of 120 minutes fire resistance rating. Such shafts and ducts should have all passive fire control meeting 120 minutes fire resistance rating requirement to meet the objective of isolation of the floor from spread of fire to upper and lower floors through shaft/duct work.

NOTE — Zoned and compartmented HVAC systems are encouraged with an approach to avoid common exhaust shafts and fresh air intake shafts which will limit the requirement of such passive measure and fire rated duct work and dampers.

2.5.4.2.3. The air filters of the air handling units should be made of non-combustible materials.

2.5.4.2.4. The air handling unit room should not be used for storage of any combustible materials.

2.5.4.3. Duct work

2.5.4.3.1. Air ducts serving main floor areas, corridors, etc, should not pass through the fire exits/exit passageway/ fire exit enclosure. Fire exits and lift lobbies, etc, should not be used as return air passage.

2.5.4.3.2. As far as possible, metallic ducts (of suitable rating) should be used even for the return air instead of space above the false ceiling.

2.5.4.3.3. Wherever the ducts pass through fire walls or floors, the opening around the ducts should be sealed with materials having fire resistance rating of the compartment {see accepted standard [F(34)]}. Such duct should also be provided with fire dampers at all fire walls and floors unless such ducts are required to perform for fire safety operation; and in such case fire damper may be avoided at fire wall and floor while integrity of the duct should be maintained with 120 minutes fire resistance rating to allow the emergency operations for fire safety requirements.

2.5.4.3.4. The ducting within compartment would require minimum fire resistance rating of 30 minutes. Such ducting material in substantial gauge should be in accordance with good practice [F(9)]. If such duct crosses adjacent compartment/floor and not having fire dampers in such compartment/floor, it will require fire resistance duct work rating of 120

minutes. The requirements of support of the duct should meet its functional ' ıe requirement as above.

2.5.4.3.5. The materials used for insulating the duct system (inside or outside) should be of non-combustible type. Any such insulating material should not be wrapped or secured by any material of combustible nature.

2.5.4.3.6. Inspection panels should be provided in the ductwork to facilitate the cleaning of accumulated dust in ducts and to obtain access for maintenance of fire dampers.

2.5.4.4. Fire or fire/smoke dampers

2.5.4.4.1. These dampers should be evaluated to be located in supply air ducts, fresh air and return air ducts/ passages at the following points:

a) At the fire separation wall,
b) Where ducts/passages enter the vertical shaft,
c) Where the ducts pass through floors, and
d) At the inlet of supply air duct and the return air duct of each compartment on every floor.

2.5.4.4.2. Damper should be of motorized type/fusible link. Damper should be so installed to provide complete integrity of the compartment with all passive fire protection sealing. Damper should be accessible to maintain, test and also replace, if so required. Damper should be integrated with fire alarm panel and should be sequenced to operate as per requirement and have interlocking arrangement for fire safety of the building. Manual operation facilities for damper operation should also be provided. Tested and certified dampers for dynamic condition are preferable.

2.5.5. Heating

2.5.5.1. Installation of chimney and heating apparatus should be in accordance with good practice [F (10)].

2.5.5.2. Boiler rooms

2.5.5.2.1. Provisions of boiler and boiler rooms should conform to The Boilers Act, 1923.

2.5.5.2.2. Further, the following additional aspects may be taken into account in the location of boiler room:

a) The boilers should be installed in a fire resisting room of 180 minutes fire resistance rating;
b) Entry to this room should be provided with a composite door of 120 minutes fire resistance rating;
c) The boiler room should be provided with its dedicated natural or mechanical ventilation system. Mechanical ventilation system for the boiler room would be accepted with 120 minutes fire resistance rating ductwork if it has interface with other mechanical areas. Ventilation system should not be allowed to be routed through electrical room area or through exit corridor/exits; and
d) The oil tank for the boiler should be provided with a dyked enclosure having a volumetric capacity of at least 10 percent more than the volume of the oil tank. The enclosure should be filled with sand for a height of 300 mm.

2.5.6. Glazing

2.5.6.1. The entire glazing assembly should be rated to that type of construction as given in Table 1. This should be applicable along with other provisions of this Schedule related to respective uses as specified therein. The use of glass should not be permitted for enclosures of exits and exit passageway.

2.5.6.2. Glass facade should be in accordance with the following:

a) For fully sprinklered buildings having fire separation of 9 m or more, tempered glass in a non-combustible assembly, with ability to hold the glass in place, should be provided. It should be ensured that sprinklers are located within 600 mm of the glass facade providing full coverage to the glass. Where the fire separation is less than 9 m, additional protection such as using a minimum 900 mm spandrel panel of 1 h fire resistance rating should be provided;

NOTE — In case of all other buildings, fire resistance rating of glass facade should be in accordance with Table 3.

b) All gaps between floor-slabs and facade assembly should be sealed at all levels by approved fire-resistant sealant material of equal fire rating as that of floor slab to prevent fire and smoke propagation from one floor to another. See also accepted standard [F (35)]; and

c) Openable panels should be provided on each floor and should be spaced not more than 10 m apart measured along the external wall from centre-to-centre of the access openings. Such openings should be operable at a height between 1.2 m and 1.5 m from the floor and should be in the form of openable panels (fire access panels) of size not less than 1 000 mm × 1 000 mm opening outwards. The wordings, 'FIRE OPENABLE PANEL — OPEN IN CASE OF FIRE, DO NOT OBSTRUCT' of at least 25 mm letter height should be marked on the internal side. Such panels should be suitably distributed on each floor based on occupant concentration. These should not be limited to cubicle areas and should be also located in common areas/corridors to facilitate access by the building occupants and fire personnel for smoke exhaust in times of distress.

2.5.7. Surface Interior Finishes

2.5.7.1. The use of combustible surface finishes on walls (including facade of the building) and ceilings affects the safety of the occupants of a building. Such finishes tend to spread the fire and even though the structural elements may be adequately fire resistant, serious danger to life may result. It is, therefore, essential to have adequate precautions to minimize spread of flame on wall, facade of building and ceiling surfaces. The finishing materials used for various surfaces and decor should be such that it should not generate toxic smoke/fumes.

2.5.7.2. The susceptibility of various types of wall surfaces to fire is determined in terms of the rate of spread of flame. Based on the rate of spread of flame, surfacing material should be considered as divided into four classes as follows {see also good practice [F(11)]}:

a) Class 1 Surfaces of very low flame spread;
b) Class 2 Surfaces of low flame spread;
c) Class 3 Surfaces of medium flame spread; and
d) Class 4 Surfaces of rapid flame spread

2.5.7.3. The uses for which surface materials falling into various classes should be adopted in buil ıg construction are given below:

Class 1	Class 2	Class 3
(1)	(2)	(3)
May be used in any situation	May be used in any situation, except on walls, facade of the building, staircase, and corridors	May be used only in living rooms and bedrooms (but not in rooms on the roof) and only as a lining to solid walls and partitions; not on staircases or corridors or facade of the building.
NOTE — Panelling (lining) may be permitted in a limited area; and is not to be permitted in a vestibule.		

2.5.7.4. Materials of Class 4 which include untreated wood fibreboards may be used with due fire-retardant treatment as ceiling lining, provided the ceiling is at least, 2.4 m from the top surface of the floor below, and the wall surfaces conform to requirements of the class [see Note under 2.5.7.3]. Class 4 materials should not be used in kitchens, corridors, and staircases. Some materials contain bitumen and, in addition to risk from spread of fire, emit dense smoke on burning; such materials should be excluded from use under these conditions and should also not be used for construction of ceiling where the plenum is used for return air in air-conditioned buildings.

2.5.7.5. When frames, walls, partitions, or floors are lined with combustible materials, the surfaces on both sides of the materials should conform to the appropriate class, because there is considerable danger from fire starting and rapidly spreading within the concealed cavity unknown to the occupants whose escape may be hampered thereby. For detailed information on materials and details of construction with their fire resistance rating, reference may be made to good practice [F(12)].

2.5.7.6. The use of aluminium composite panels as external facade of the buildings should be avoided; if used, such panels should have a minimum of 70 percent mineral core and pass the tests as in accepted standards (see Note 2).

NOTES

1) When combustible materials are used for lining frames, walls, partitions, or floors, the surfaces on both sides of the materials must meet the required fire resistance class. This precaution helps mitigate the risk of fire spreading within concealed cavities, which may not be immediately visible to occupants and can hinder evacuation.
2) Accepted standards can be ISO 3957 or ISO 13785 (Part 1 and Part 2).

3. LIFE SAFETY PROVISIONS

3.1. General

Every building should be so designed, constructed, equipped, maintained, and operated as to provide adequate means of egress to avoid undue danger to the life and safety of the occupants from fire, smoke, fumes, or panic during the time period necessary for escape. For high occupancy areas, it may be required to have annunciation, announcements, and voice guided/aided system to direct the occupants towards safe egress routes, areas of comparative safety or exits, and to avoid situation of panic during distress. Every main occupancy may have

certain occupancies which may be incidental to the main occupancy. The exit requirements pertaining to such incidental occupancies from the floor of the occupancy to the level of exit discharge should be calculated to meet the requirement of the actual occupancy of such type, to ensure adequate means of egress of the occupants.

See also good practice [F(31)] for accessibility for elderly and persons with disabilities, for various requirements for enabling a smooth and safe egress.

3.2. General Exit Requirements

3.2.1. Fire exits are unobstructed component of means of egress which is between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways (pressurised), exit stairway with external wall (pressurised or naturally ventilated), exterior exit stairways, exit passageways, and exterior exit ramps. Fire exits should be provided with panic bar to facilitate entry of occupant into fire exit. An exit may also include a horizontal exit leading to an adjoining building/fire compartment having its further access to unlocked/public exit at the same level.

3.2.2. Unless otherwise specified, lifts, escalators, moving walks and revolving doors should not be considered as fire exits and should not constitute any part of the required fire exit.

3.2.3. Every fire exit, exit passageway and exit discharge should be continuously maintained free of all obstructions or impediments to full use in the case of fire or other emergency.

3.2.4. Every building having human occupancy should be provided with fire exits sufficient to permit safe egress of occupants, in case of fire or other emergency.

3.2.5. In every building or structure, fire exits should comply with the minimum requirements of this Schedule, except those not accessible for general public use.

3.2.6. No building should be so altered as to reduce the number, width, or protection of fire exits to less than that required.

3.2.7. For non-naturally ventilated areas (that is, pressurized areas), fire doors with 120 minutes fire resistance rating should be provided and particularly at the entrance to lift lobby and stair well where a 'funnel or flue effect' may be created, inducing an upward spread of fire, to prevent spread of fire and smoke.

3.2.8. Fire exits should be so arranged that they may be reached without passing through another occupied unit/passage in others control if they pose challenge or restriction in means of egress.

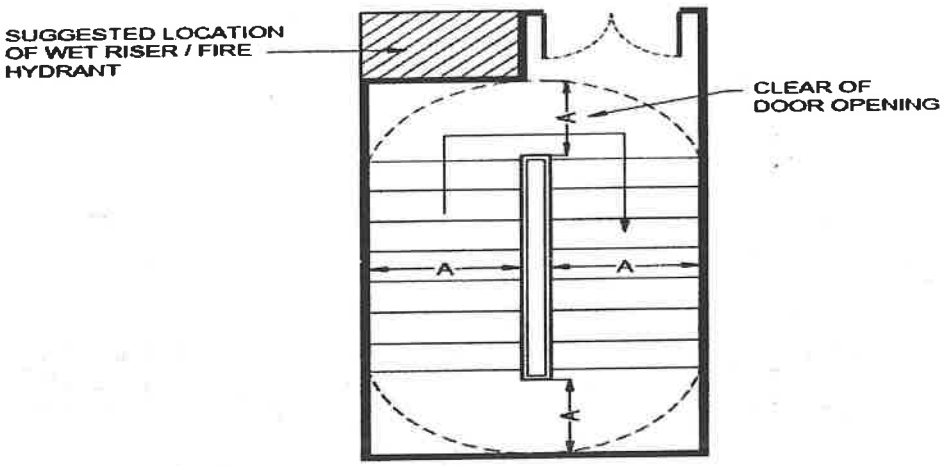
3.2.9. Doors in fire exits should open in the direction of exit. In case of assembly buildings (Group D) and institutional buildings (Group C-1), exit door should not open immediately upon a flight of stair and all such entries to the stair should be through a landing, so that such doors do not impede movement of people descending from a higher floor when fully opened (see Fig. 7A). While for other occupancies, such doors should not reduce the pathway in the landing by more than half the width of such staircase (see Fig. 7B). Over- head or sliding doors should not be installed.

3.2.10. At least half of the required exit stairs from upper floors (rounded to the next higher number) should discharge directly to the exterior or through exit passageways. For buildings less than 60 m in height, firefighting shaft should be planned having one side on the external wall and discharging directly to the exterior. In the case of tall buildings (60 m and above), where structural design requires the location of firefighting shaft along with the structural core

members, firefighting shaft(s) in the building should discharge directly to the exterior (thro ;h exit passageway).

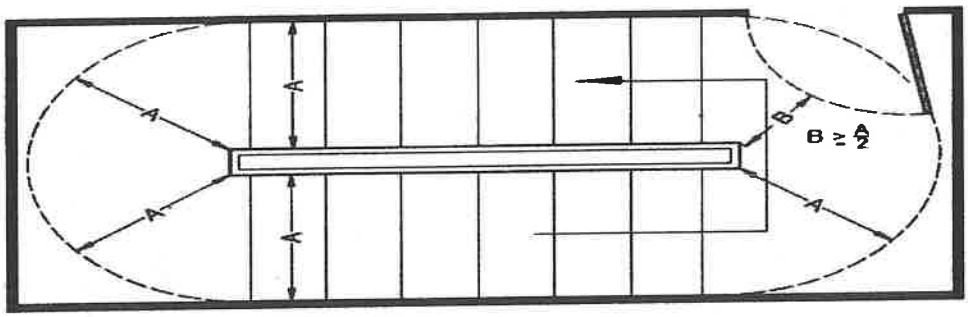
3.2.11. Unless otherwise specified, all the fire exits and exit passageways to exit discharge should have a clear ceiling height of at least 2.4 m. However, the height of fire exit door should be at least 2.0 m (see Fig. 8).

3.2.12. Where changes in elevation of more than 300 mm are encountered in the exits, ramps or sloped surfaces should be used with handrails and floor finish materials that contrast with the adjacent finish materials.



NOTE — DOOR WIDTH SHALL BE BASON TYPE OF OCCUPANCY

7A MINIMUM REQUIRED UNOBSTRUCTED CLEARANCE WITH DOOR LEAF ENCROACHING ON LANDING IN INSTITUTIONAL AND ASSEMBLY BUILDING



A - REQUIRED WIDTH

7B MINIMUM REQUIRED UNOBSTRUCTED CLEARANCE WITH DOOR LEAF ENCROACHING ON LANDING

FIG. 7 DOOR LOCATION AT LANDING IN FIRE EXITS

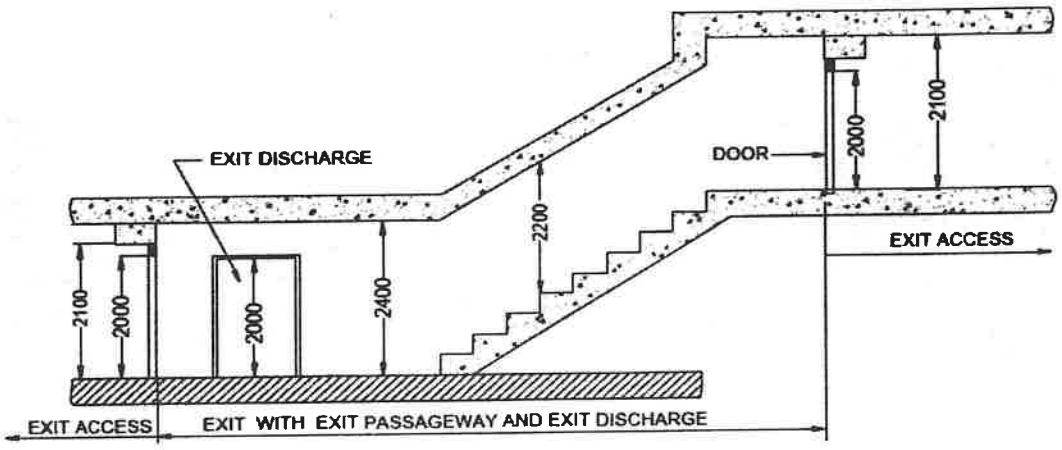


FIG. 8 MINIMUM HEAD ROOM MEASUREMENT

3.2.13. The capacity of the means of egress required from any storey of the building should not be reduced along the path of egress travel until arrival to the exit discharge.

3.2.14. The lifts, escalators, moving walks, turnstiles and revolving doors should not be considered in determining the required capacity of means of egress for the individual floor(s) or the building.

3.2.15. Turnstiles or similar devices that restrict travel to one direction or that are used to restrict unauthorized entry should not be so placed as to obstruct any required means of egress. Alternative door openings of required exit width should be available within 3 m of such devices, if installed.

3.2.16. Suitable means should be provided so that all access-controlled exit doors, turnstiles, boom barriers and other such exits should automatically operate to open mode during emergencies like fire, smoke, acts of terrorism, etc, so that people can safely and quickly egress into safe areas outside. If required, a master controlling device may be installed at a strategic location to achieve this.

3.2.17. Penetrations into and openings through fire exit are prohibited except those necessary, like for the fire protection piping, ducts for pressurization and similar life safety services. Such openings as well as vertical passage of shaft through floors should be protected by passive systems, {see accepted standard [F(34)]}.

3.2.18. Walking surfaces in exit access should comply with the following requirements for smooth exit:

a) Walking surfaces should be nominally level;
b) The slope of walking surface in the direction of travel should not exceed 1 in 20 unless the ramp requirements are met (see 3.4.2.4.3.5);
c) Slope perpendicular to the direction of travel should not exceed 1 in 48; and
d) Walking surfaces should be slip-resistant along the entire path of travel.

3.2.19. Basement

3.2.19.1. The basement should not be used for hazardous and vulnerable activities, like sleeping purposes, class rooms, hazardous industries, restaurant kitchen (see also 3.7.9), battery rooms, UPS rooms, fuel oil storage, etc However, the State Authorities may prescribe the list

of such activities based on their own assessment. Basements should have smoke ventilation systems, high-density sprinkler systems, and redundant/enclosed exits.

3.2.19.2. The fire exits in a basement should be sufficient to provide for the capacity of the basement occupancy as determined in accordance with 3.4.2.1. In no case should there be fewer than two independent basement exits.

3.2.19.3. Basements with incidental occupancies to the main occupancy should be planned with exit requirements for the actual occupancy within the basement.

3.2.19.4. Where a basement is used for car parking and also there is direct approach from any occupancy above to the basement, door openings leading to the basement should be protected with fire doors with 120 minutes fire resistance rating, except for exit discharge doors from the basements.

3.2.19.5. Basements should have a minimum clear height of 3.4 m towards effective performance in the event of fire/smoke. Impulse or duct ventilation system needs to be designed to ensure removal of hot gases and smoke from each compartment to achieve reasonable visibility and heat reduction for firefighting operations.

3.3. Occupant Load

For determining the fire exits required, the number of persons within any floor area or the occupant load should be based on the actual number of occupants declared, but in no case less than that specified in Table 4. The occupant load of a mezzanine floor discharging to a floor below should be added to that floor occupancy and the capacity of the fire exits should be designed for the total occupancy load thus established.

The occupant load of each storey considered individually should be required to be used in computing the number of means of egress at each storey, provided that the required number of means of egress is not decreased in the direction of egress travel.

TABLE 4

OCCUPANT LOAD

Sl No.	Building Occupancy	Net Occupant Load Factor (m2/person) (see Note 7)	Gross Occupant Load Factor (m2/person) (see Note 1)
(1)	(2)	(3)	(4)
1)	Group A: Residential	12.5	-
2)	Group B: Educational	3	-
3)	Group C: Institutional (see Note 2)		
	a) Nursing homes	-	12.0
	b) Clinic (daycare)	-	12.0
	c) Inpatient area in hospital (like ward, sleeping area)	11.0	-
	d) Outpatient area in hospital	7.0	-
4)	Group D: Assembly		
	a) Concentrated use without fixed seating	0.65	-
	b) Less concentrated use without fixed seating such as pre-function, multipurpose hall)	1.40	-

	c) Fixed seating	see Note 4	-
	d) Dining areas and restaurants with seating and table	1.80	-
	e) Gymnasium, sports room, library and alike with equipment, stacks and the like. This includes performance stages, indoor badminton court, squash court with limited number of performers and player (while audience for the same if any should be under (c) as above).	4.6	-
	f) Swimming pool		
	1. Water surface	3.5	-
	2. Deck	2.0	-
	g) Mall – Basement with sales floor	2.1	-
	h) Mall – Street floor	2.1	-
	i) Mall – Upper sales floor	4.3	-
	j) Mall – Food court	-	1.8
	k) Mall – Theatre screens	-	see Note 4
	l) Storage/warehouse, receiving and the like	14.3	-
5)	Group F: Mercantile		
	a) Street floor and above	-	2.1
	b) Below street floor	-	3.0
6)	Group E: Business	7.1	
7)	Group E: For Datacentres	-	20.0
	a) Admin areas	-	10.0
	b) Data hall, server room, equipment room areas	-	50.0
8)	Group G: Industrial		
	a) Low hazard	-	20.0
	b) Moderate hazard	-	15.0
	c) High hazard	-	10.0
9)	Group H: Storage (see Note 5)	-	30.0
10)	Group J: Hazardous	-	10.0

NOTES

1) Gross area is the floor area
2) Occupant load factor in dormitory portions of homes for the aged, orphanages, insane asylums, etc, where sleeping accommodation is provided, should be calculated at not less than 7.5 m2 gross floor area/person.
3) Commercial kitchen in the above occupancies should be calculated at 9.3 m2 net floor area/person.
4) In case of assembly occupancy having fixed seats, the occupant load should be determined by multiplying the number of seats by 1.2.
5) Car parking areas under occupancy other than storage should also be 30 m2 per person.
6) Usable carpet area is the total of all corridors, passages, enclosed offices/rooms excluding rack and UPS/battery footprint
7) Net area is not the carpet area.

* Gross area is highly recommended to be used than the net area, to avoid double counting. Net area is possible to be indicated for spaces having concentration of people is typical in certain occupancies; and other common spaces/areas in a floor plate may be used by the same set of occupants. Moreover, gross area provides a safer, more conservative occupant load for the entire floor, ensuring exits are sized for the maximum possible capacity. Further, net area is used for specific rooms (like classrooms

or assembly halls) where the furniture and layout are predictable but using it for an entire floor pl ɜ often underestimates the total population because it excludes corridors, closets, and wall thicknesses where people still circulate.

3.4. Egress Components

Egress components to be considered are the number of exits to which access is provided, capacity of exit access, travel distance to a fire exit, the obviousness of the direction to a fire exit, and any hindrance including due to security issues involved.

3.4.1. Exit Access

a) A common path of travel is desirable in exit access which leads to two independent directions to separate fire exits;

b) **Capacity of Exit Access —** The width of corridors, aisles or ramps required for exit access should be sufficient to ensure a smooth flow of occupants to the fire exit. Where a corridor is the only way of access to a fire exit, the corridor width should not be less than the calculated exit width;

c) Objects like tables, chairs or any other temporary/permanent structures in exit access corridors should be avoided as this may result in congestion and also impeding smooth flow of personnel during emergencies;

d) In order to ensure that each element of the means of egress can be effectively utilized, they should all be properly lit and marked. Lighting should be provided with emergency power back-up in case of power failures. Also, exit signs of adequate size, marking, location, and lighting should be provided so that all those unfamiliar with the location of the fire exits may safely find their way;

e) Exit access to fireman's lift and refuge area/spaces on the floor should be step free and clearly signposted with the international symbol of accessibility;

f) Exit access should not pass through storage rooms, closets or spaces used for similar purpose; and

g) The calculation of capacity of exit access should be in accordance with 3.4.2.4.

3.4.2. Exits

3.4.2.1. Number of fire exits

The minimum required number of exits in a building should be determined based on occupant load (see Table 4) and width required per person (see Table 5) as appropriate to the type of exit for respective occupancies, subject to complying with maximum travel distance requirement (see Table 6).

3.4.2.2. Arrangement of fire exits

a) Fire exits should be so located that the travel distance on the floor should not exceed the distance given in Table 6.

b) Travel distance should be measured from the most remote point within a storey or a mezzanine floor along the natural and unobstructed path of horizontal or vertical egress travel to the door of a fire exit.

c) The dead-end corridor length in exit access should not exceed 6 m for educational, institutional and assembly occupancies. For other occupancies, the same should not exceed 15 m (see Fig. 9).

d) Fire exits should be placed as remote from each other as possible and should be arranged to provide direct access in separate directions from any point in the area served (see Fig. 10).

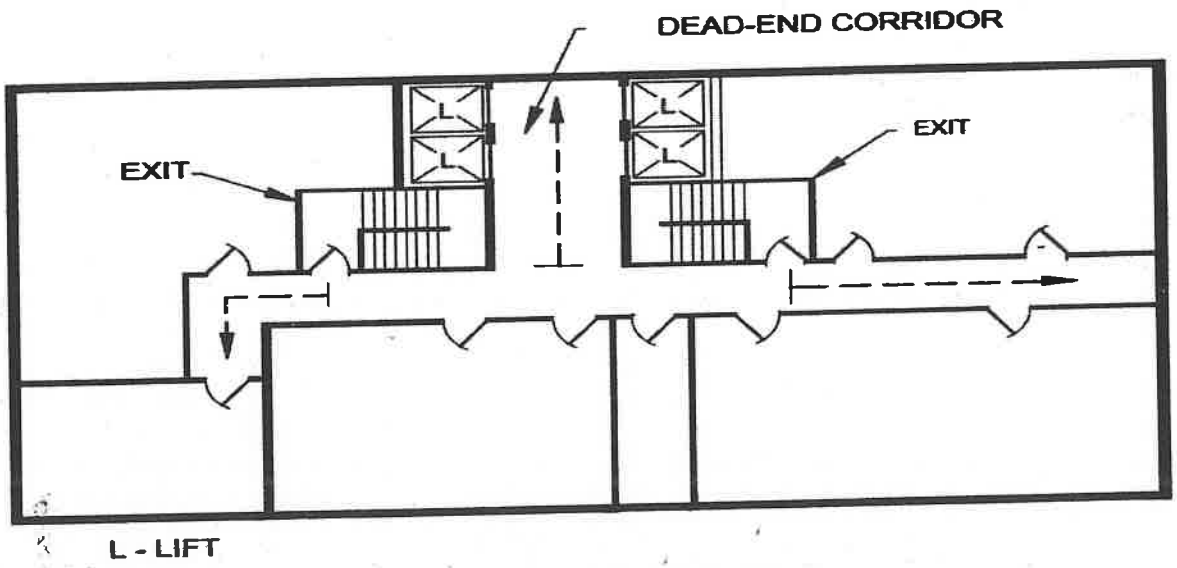
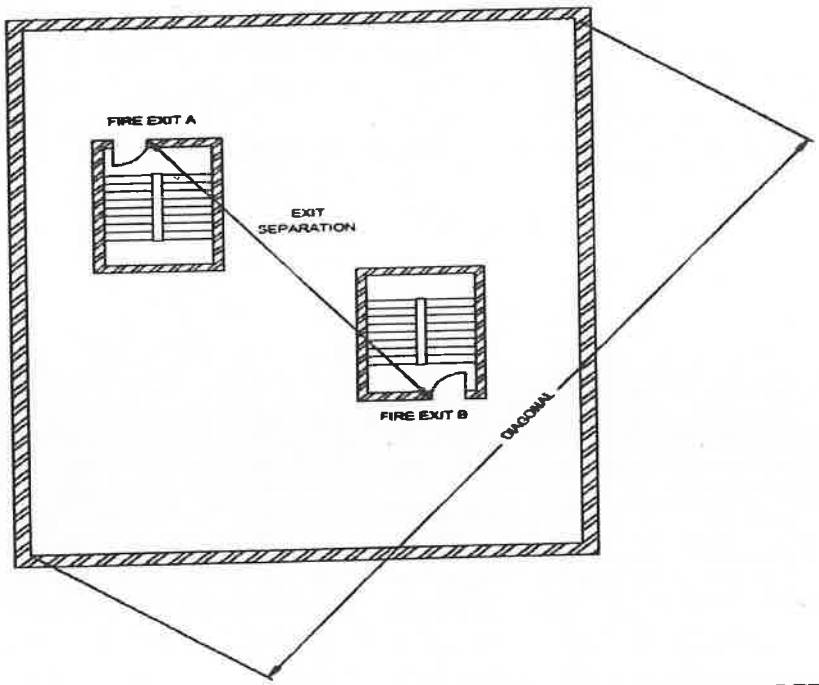


FIG. 9 DEAD END CORRIDOR



NOTE — MINIMUM EXIT SEPARATION = DIAGONAL/2 (FOR UNSPRINKLERED)
= DIAGONAL/3 (FOR SPRINKLERED)

FIG. 10 FIRE EXIT SEPARATION

3.4.2.3. Capacities of means of egress

a) Exit capacity is the number of people that can pass through a stairway, and level components (door and corridor) and ramps. The total capacity of all the respective means of egress serving a floor should be sufficient to allow egress of the entire population of the floor.

b) The unit of exit width, used to measure the capacity of any exit, is 500 mm. A clear width of 250 mm needs to be counted as an additional half unit. Clear widths less than 250 mm need not be counted for exit width.

c) Width per person for stairways, and level components and ramps are to be determined using the capacity factors in accordance with Table 5.

For example, if an exit doorway measures 1 000 mm in clear width its capacity factor being 6.5, it would be defined as providing exit capacity for 1 000/6.5 occupants, that is, 153 persons (say 150 persons) and number of such exit doorways can then be calculated depending on the occupant load.

d) When calculating stairways, level components and ramps and other exit means, the capacity of the entire system should have to be based upon the minimum capacity available from any part of the system. The corridor, if so provided, should also to be planned with consideration of exit access adequacy for the number of occupants. Further, consider the situation of doors opening to an exit stairway. If the stairway provides an exit capacity of 150 persons, and the doors leading into the stairway provide an exit capacity of 153 persons, the overall exit system would be considered to provide the minimum exit capacity of only 150 persons afforded by the stairway. The exit planning will be limited by the most restrictive exit calculation under the means of egress.

e) In the procedures for determining required egress capacity, the number of required means of egress is based on a floor-by-floor consideration, rather than the accumulation of the occupant loads of all the floors. However, the number of means of egress cannot decrease as an occupant proceeds along the egress path.

TABLE 5

CAPACITY FACTORS

Sl No.	Occupancy Group	Width per Person mm	
		Stairways	Level Components and Ramps
(1)	(2)	(3)	(4)
1	Residential (Group A)	10	6.5
2	Educational (Group B)		
3	Institutional (Group C)	15	13
4	Assembly (Group D)	10	6.5
5	Business (Group E)		
6	Mercantile (Group F)		
7	Industrial (Group G)		
8	Storage (Group H)		
9	Hazardous (Group J)	18	10

3.4.2.4. Types of exit access and exits

Various types of exit access and exits are doorways, corridors and passageways, horizontal exits, internal staircases, exit passageways, external staircases, and ramps.

3.4.2.4.1. Doorways

a) Every exit doorway should open into an enclosed stairway or a horizontal exit of a corridor or passageway providing continuous and protected means of egress (see Fig. 11 on unaccepted arrangement of doors in a stair).

b) No exit doorway should be less than 1000 mm in width. Door width in exits should also meet requirement of level components given in Table 5 except assembly buildings, where door width should be not less than 2000 mm (see Fig. 12). Doorways should be not less than 2000 mm in height.

c) Exit doorways should be operable from the side which they serve, without the use of a key.

d) Mirrors should not be placed on exit doors and in exits, to avoid confusion regarding the direction of exit.

e) Revolving doors can be accepted as a component in a means of egress where the following requirements are fully complied with:

1) Doors should be capable of collapsing to a book fold position with parallel egress paths, of width not less than 1000 mm.

2) Doors should not be located within 3 m of the foot or top of stairs or escalators. A dispersal area should be provided between the stairs or escalators and the doors.

3) Each revolving door should be provided with a hinged door in the same wall within 3 m thereof, with same exiting capacity.

4) Each revolving door should be considered as capable of exiting only 50 persons.

f) All fire rated doors and assembly should be provided with certificate and labels prominently indicating the manufacturer's identification, door details covering door type, serial/batch number, month and year of manufacture, fire resistance rating, etc. The doors and assembly should be certified with all prescribed hardware such as hinges, locks, panic bars, door closers, and door viewers.

g) **Access controlled doors** — Access controlled doors and electromagnetic doors should fall under this category. These should meet the following requirements:

1) Doors should have fire rating as per the requirements at the location of installation;

2) Activation of the building automatic sprinkler or fire detection system, if provided, should automatically unlock the doors in the direction of egress, and the doors should remain unlocked until the automatic sprinkler system or fire-alarm system has been manually reset;

3) Loss of power to the part of the access control system that locks the doors should automatically unlock the doors in the direction of egress;

4) A manual release device should be provided in the readily accessible vicinity of the egress door with a signage 'PUSH TO EXIT' and when the same is operated, it should result in direct interruption of power to the lock, independent of the access control system electronics.

h) **Turnstiles** — Turnstiles or similar devices that restrict travel to one direction or are u ed to collect fares or admission charges should not be placed so as to obstruct any required means of egress unless door openings of required width are available within 3 m thereof. Turnstiles or such similar devices should also be disengaged through automatic or manual intervention to allow egress in the direction of exit.

i) Doors in folding partition should not be treated as approved means of egress.

TABLE 6

TRAVEL DISTANCE (BASED ON OCCUPANCY AND CONSTRUCTION TYPE)

Sl No.	Occupancy Group	Maximum Travel Distance (m)		
		Types 1 and 2 (Unsprinklered)	Types 1 and 2 (Sprinklered)	Types 3 and 4
(1)	(2)	(3)	(4)	(5)
1	Residential (Group A)	30.00	60.00	22.50
2	Educational (Group B)	30.00	45.00	22.50
3	Institutional (Group C)	30.00	45.00	22.50
4	Assembly (Group D)	30.00	45.00	30.00
5	Business (Group E)			
	Businesses (including admin area of Datacentre building)	30.00	60.00	30.00
	Datacentre building	N.A.	60.00	N.A.
6	Mercantile (Group F)	30.00	45.00	30.00
7	Industrial (Group G)			see Note 3
	G-1, G-2	45.00	60.00	
	G-3	22.50	45.00	
8	Storage (Group H)	30.00	90.00	
9	Hazardous (Group J)	22.50	30.00	

NOTES

1. The common path of travel should be not more than 50 percent of the above distances.
2. Ramps are not to be counted as an exit in case of basements below the first basement in car parking.
3. Construction of Type 3 or Type 4 is not permitted.
4. Utility service areas and equipment areas may be exempt from the measurement of travel distance from within the room.
5. For ceiling height 10 m or above at ground floor in buildings such as airports, exhibition halls, convention centres, atrium in shopping malls, entrance lobbies and the like and provided with sprinkler system, the travel distance in such areas may be increased by 100 percent of the values specified. This is not to be applied to the values given in col (4) above.
6. In such buildings having ceiling heights 17 m or more and would have sprinkler exemption, the travel distance of such areas may be allowed to be increased by 100 percent of the values specified. This is not to be applied to the values given in col (4) above. In such cases, to prevent heat build-up at ceiling level, suitable smoke/heat venting systems are recommended.

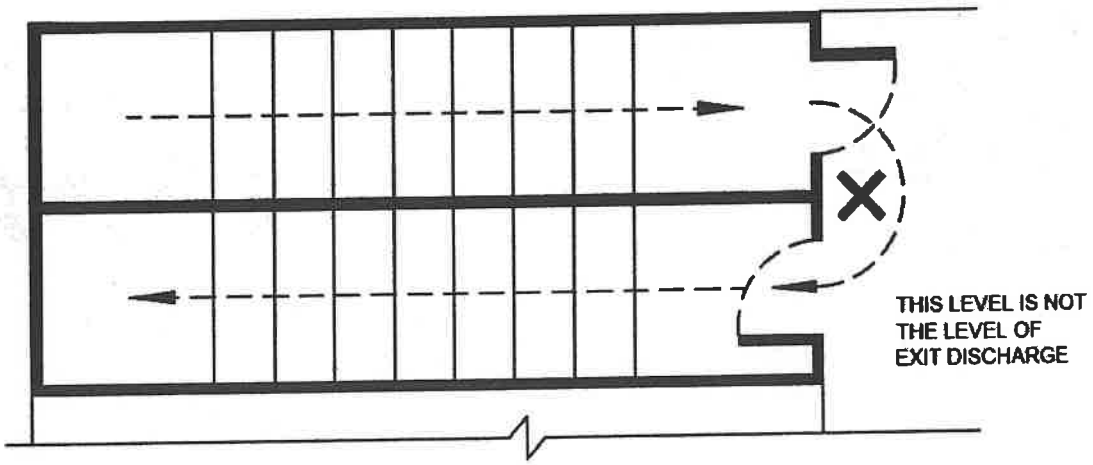


FIG. 11 UNACCEPTABLE ARRANGEMENT FOR ENCLOSING A STAIR SERVING AS A REQUIRED EXIT

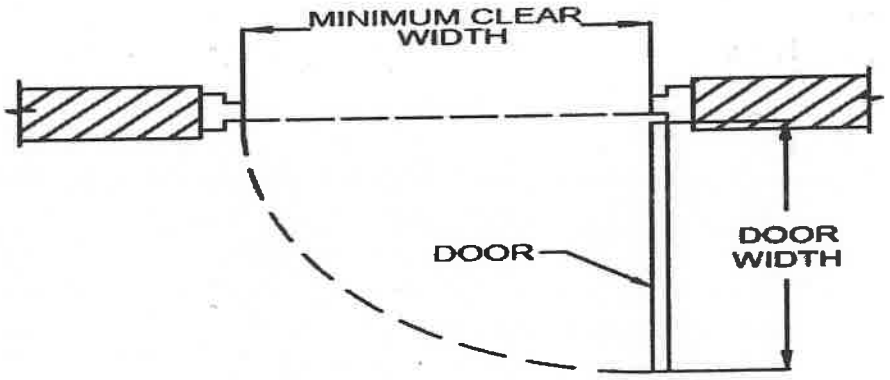


FIG. 12 MINIMUM CLEAR DOOR WIDTH

3.4.2.4.2. Corridors and passageways of means of egress

a) Corridors and passageways should be of width not less than the calculated aggregate width of exit doorways leading from them in the direction of travel to the exit (see Table 5 and Table 6); and

b) In the case of buildings where there is a central corridor, which is part of exit access, the doors of rooms (except for rooms having assembly occupancy) should open inwards to permit smooth flow of traffic in the corridor.

3.4.2.4.3. Staircases

3.4.2.4.3.1. General

The requirements of number of staircases should supplement the requirement of different occupancies. All high rises and special buildings, should have a minimum of two staircases. The actual number of staircases should comply with the requirement of 3.4.2.1.

NOTE — These required fire exit staircases calculated as per the laid down provisions, are recommended to be free of FAR.

All exit staircases should discharge, at the level of exit discharge, to the exit discharge, eitl :,

a) directly, or
b) through an exit passageway, or
c) through a large lobby.

At least 50 percent of the staircases should discharge as per (a) and/or (b) above. For firefighting shafts, it is preferred to have the discharge through (a), or as an alternate through (b). Option (c) is not applicable for firefighting shafts. In case of residential buildings and educational buildings, firefighting shafts should discharge through (a) only. Each compartment should be planned with its access to the firefighting shaft. In buildings/floors having three or more compartments, there should be at least two firefighting shafts to serve the compartments. In buildings/floors having three or more compartments, there should be at least two firefighting shafts to serve the compartments. The minimum width of tread without nosing should be 250 mm for staircase of residential buildings. This should be minimum 300 mm for assembly, hotels, educational, institutional, business, and other buildings. The treads should be constructed and maintained in a manner to prevent slipping. The maximum height of riser should be 175 mm for staircase of one- or two-family dwelling residential buildings and 150 mm for other buildings. The number of risers in a flight is recommended as 12. However, considering the floor-to-floor height, there should not be more than 15 risers in a flight. The staircases may be internal staircases or external staircases.

3.4.2.4.3.2. Internal staircases

The internal staircases may be constructed with an external wall, or otherwise, and should comply with the following:

a) Internal stairs should be constructed of non-combustible materials throughout, and should have fire resistant rating of minimum 120 minutes.
b) A staircase should not be arranged round a lift shaft.
c) Fire exits should not be used as a portion of a supply, return or exhaust air system serving adjoining areas. Any opening(s) should not be permitted in walls or in doors, separating fire exits from adjoining areas.
d) No flue chimney, electromechanical equipment, air conditioning units, gas piping or electrical panels should be allowed in the stairway.
e) Notwithstanding the detailed provision for exits in accordance with 3.2 and 3.3, the following minimum width should be provided for staircases for respective building typology:

1. Residential building (One- or two-family dwellings) : 1.00 m

NOTE — For row housing with 2 storeys, the minimum width should be 0.75 m.

2. Residential building (A-I, A-II and A-III) : 1.25 m
3. Residential hotel building (A-IV and A-V) : 1.50 m
4. Assembly building: 2.00 m

NOTE — The width of stairs may be accepted to be 1.50 m in case of assembly occupancy having less than 150 persons.

5. Educational building: 1.50 m
6. Institutional building: 2.00 m

Maximum width of stairs in hospitals should be 2.00 m.

7. All other buildings: 1.50 m

NOTE — Where staircase width is above 2.00 m, it is recommended to provide a central handrail.

f) A handrail should be provided on one side of the staircase of width less than 1 500 mm, and on both sides of the staircase of width 1 500 mm and more. The projection of handrail(s) in the staircase width should not be more than 90 mm.

g) Handrails may project inside the measured width by not more than 90 mm.

h) The design of staircase should also take into account the following:

1) The minimum headroom in a passage under the landing of a staircase and under the staircase should be 2.2 m.
2) Access to fire exit staircase should be through a fire door of a minimum 120 minutes fire resistance rating.
3) No living space, store or other fire risk should open directly into staircases.
4) The exit (including staircases) should be continuous from refuge floors or terrace level, as applicable, to the level of exit discharge.
5) No electrical shafts/air conditioning ducts or gas pipes, etc, should pass through or open in the staircases.
6) Lifts should not open in staircase (or in mid-landings).
7) No combustible material should be used for decoration/wall panelling in the staircase.
8) Beams/columns and other building features should not reduce the head room/width of the staircase.
9) The floor indication board, indicating the location/designated number of staircase, respective floor number and direction to exit discharge should be placed inside the staircase, on the wall nearest to the fire door. It should be of size not less than 300 mm × 200 mm (see Fig. 13).
10) Individual floors should be prominently indicated on the wall outside the staircase and facing it.
11) All staircase should terminate at the level of exit discharge. The access to the basement should be by a separate staircase.
12) Scissors type staircases (of type where intermingling of persons in the landing is possible or of type where both stairs use the common air space) should not be treated as part of exit.

3.4.2.4.3.3. Curved stairs

Curved stairs should not be treated as part means of egress. However, these may be used as part of exit access provided the depth of tread is not less than 280 mm at a point 350 mm from the narrower end of the tread and the smallest radius is not less than twice the stair width.

3.4.2.4.3.4. External staircases

The external staircases are the staircases provided on the external wall/facade, and should comply with the following:

a) External stairs should always be kept in sound and usable condition;
b) All external stairs should be directly connected to the ground;

c) Entrance to the external stairs should be separate and remote from the inte ıal staircase;

d) Where an external staircase is provided, it should be ensured that the use of it at the time of fire is not prejudiced by smoke and flame from openings (for example, windows, doors) in the external face of the building. Care should be taken to ensure that no external wall or window opening opens on to or close to an external stair. If such openings exists within 3 m from an external staircase, they should be protected with fire rated doors/window assemblies with rating of at least 60 minutes (see Fig. 14);

e) The external stairs should be constructed of non-combustible materials, and any doorway leading to it should have minimum 120 minutes fire resistance;

f) No external staircase, should be inclined at an angle greater than 45° from the horizontal;

g) External stairs should have straight flight not less than 1500 mm wide;

h) Handrails, to be provided on both sides, should be of a height not less than 1000 mm and not exceeding 1200 mm. There should be provisions of balusters with maximum gap of 150 mm; and

i) The use of spiral staircase should be limited to low occupant load and to a building not exceeding 9 m in height. A spiral staircase should be not less than 1 500 mm in diameter and should be designed to give adequate headroom.

3.4.2.4.3.5. Ramps

a) Ramps should comply with all the applicable requirements for staircases regarding enclosure, capacity (see also Table 5) and limiting dimensions;

b) The slope of a ramp should not exceed 1 in 12 (8 percent);

c) Ramp(s) should be surfaced with approved slip resistant materials that are securely attached. No perforations are permissible on ramp floors;

d) Any changes in travel direction in ramp should be preceded by landings of minimum 1.5 m × 1.5 m size;

e) Ramps and intermediate landings should continue with no decrease in width along the direction of egress travel;

f) Outside ramps and landings should be designed to minimize water accumulation on their surfaces;

g) Ramps should have landings located at the top, at the bottom, and at doors opening onto the ramp;

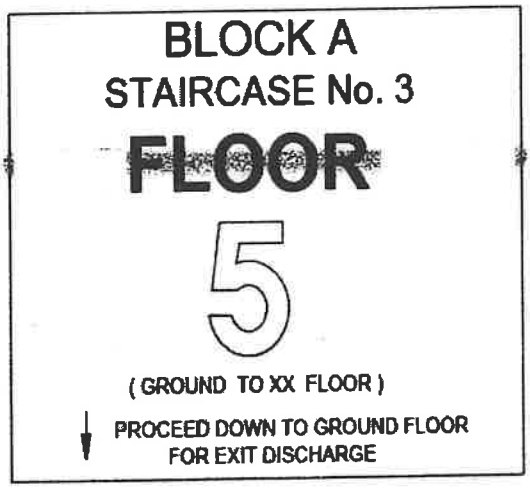
h) Every landing should be not less than 1 500 mm long in the direction of travel;

i) Where the ramp is not part of an accessible route, the ramp landings should not be required to exceed 1 250 mm in the direction of travel, provided that the ramp has a straight run; and

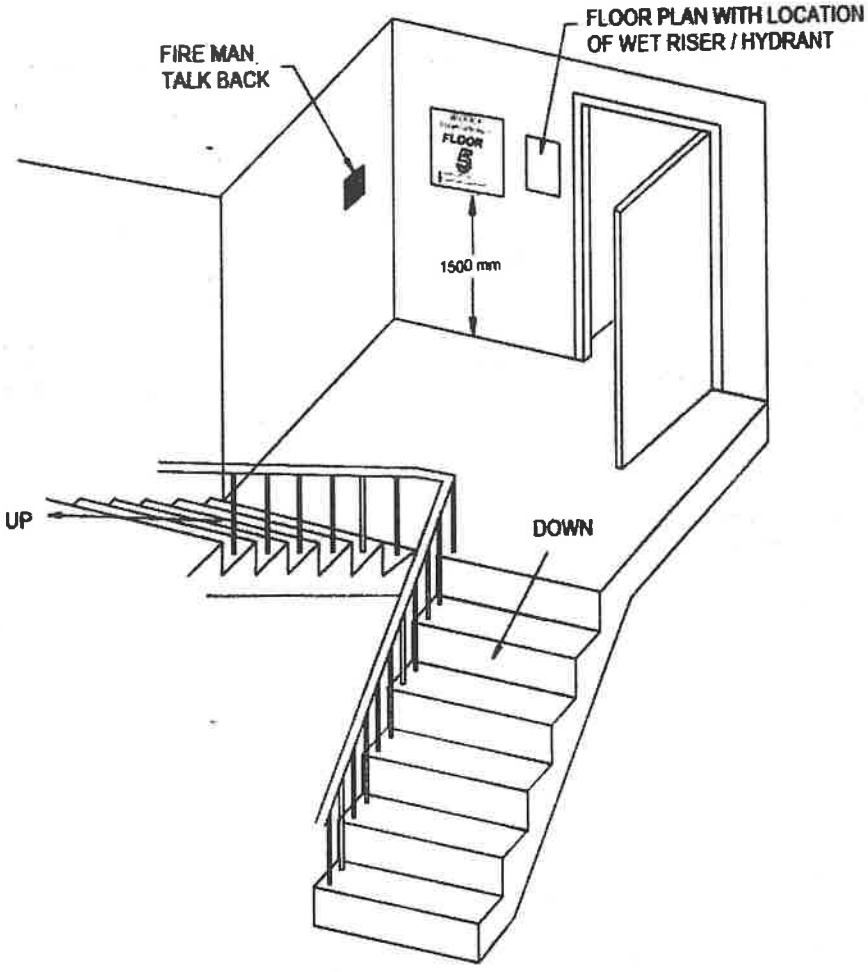
j) Handrails should be provided on all ramps on both sides.

NOTE — Above requirements are not applicable to basement car parking ramps.

The ramps should, in addition, comply with the requirements given in good practice [F (31)].



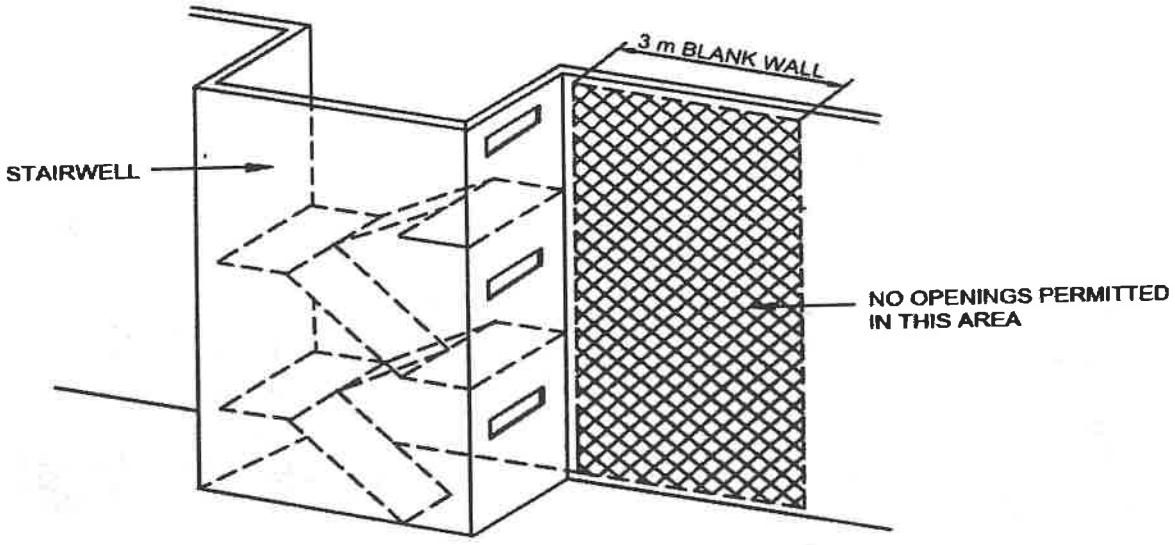
9A EXAMPLE OF A STAIRWAY MARKING SIGN (FLOOR INDICATION BOARD)



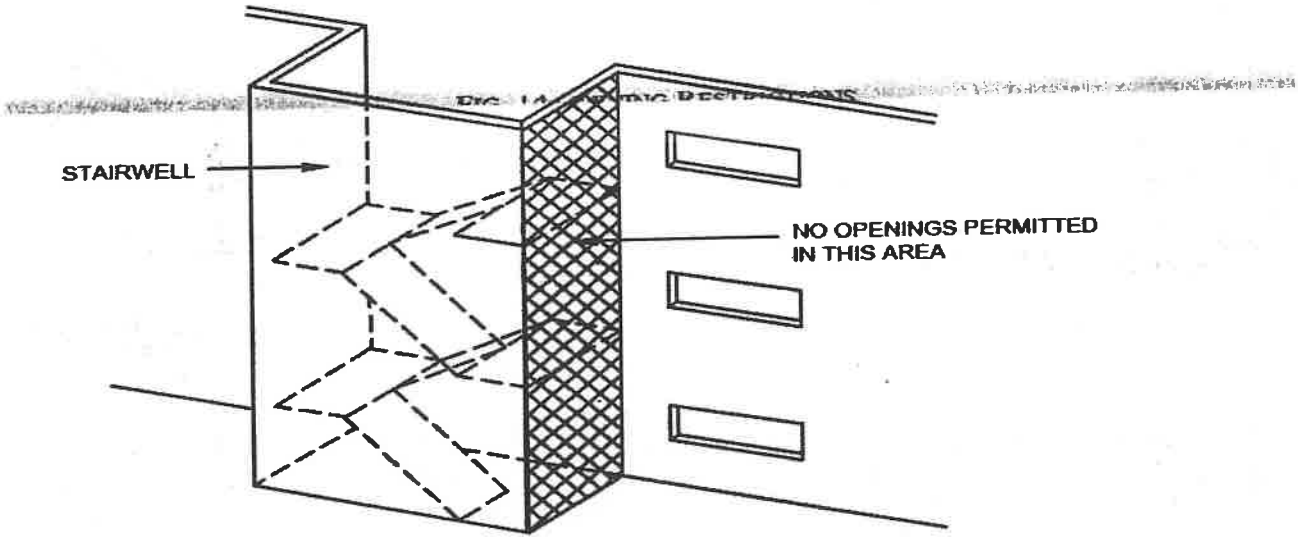
9B STAIR SIGN PLACEMENT

NOTE — BLOCK/WING/BUILDING NAME TO BE PROJECT SPECIFIC. STAIRCASE No. SHOWN AS "3" IS INTENDING TO SHOW THE NUMBER ASSIGNED TO THE STAIRCASE. ALL EXITS PREFERABLY TO BE ASSIGNED WITH NUMBER /IDENTIFICATION ENABLING OCCUPANT/FIRE MAN TO DECLARE LOCATION / POSITION.

FIG. 13 SIGN MARKING AND REQUIREMENT IN EXIT



14A LIMITATIONS ON OPENINGS NEAR STAIRWELL



14B OPENING RESTRICTIONS ON STAIRWELL WALLS

FIG. 14 OPENING RESTRICTIONS

3.4.2.5. Smoke control of exits

a) In building design, compartmentation plays a vital part in limiting the spread of fire and smoke. The design should ensure avoidance of spread of smoke to adjacent spaces through the various leakage openings in the compartment enclosure, such as cracks, openings around pipes ducts, airflow grills and doors. In the absence of proper sealing of all these openings, smoke and toxic gases will obstruct the free movement of occupants of the building through the exits. Pressurization of staircases is of great importance for the exclusion of smoke and toxic gases from the protected exit.

b) Pressurization is a method adopted for protecting the exits from ingress of smoke, especially in high-rise buildings. In pressurization, air is injected into the staircases, lobbies, etc, as applicable, to raise their pressure slightly above the pressure in adjacent parts of the building. As a result, ingress of smoke or toxic gases into the exits will be prevented. The pressurization of staircases and lift lobbies should be adopted as given in Table 5. The pressure difference for staircases should be 50 Pa. Pressure differences for lobbies (or corridors) should be between 25 Pa and 30 Pa. Further, the pressure differential for enclosed staircase adjacent to such lobby (or corridors) should be 50 Pa. For enclosed staircases adjacent to non-pressurized lobby (or corridors), the pressure differential should be 50 Pa.

c) Equipment and ductwork for staircase pressurization should be in accordance with one of the following:
   1) Directly connected to the stairway by ductwork enclosed in non-combustible construction.
   2) If ducts used to pressurize the system are passed through shafts and grilles are provided at each level, it should be ensured that hot gases and smoke from the building cannot ingress into the staircases under any circumstances.

d) The normal air conditioning system and the pressurization system should be designed and interfaced to meet the requirements of emergency services. When the emergency pressurization is brought into action, the following changes in the normal air conditioning system should be effected:
   1) Any re-circulation of air should be stopped and all exhaust air vented to atmosphere.
   2) Any air supply to the spaces/areas other than exits should be stopped.
   3) The exhaust system may be continued provided,
      (i) the positions of the extraction grills permit a general air flow away from the means of egress;
      (ii) the construction of the ductwork and fans is such that, it will not be rendered inoperable by hot gases and smoke; and
      (iii) there is no danger of spread of smoke to other floors by the path of the extraction system which can be ensured by keeping the extraction fans running.

e) For pressurized stair enclosure systems, the activation of the systems should be initiated by signalling from fire alarm panel.

f) Pressurization system should be integrated and supervised with the automatic/manual fire alarm system for actuation.

g) Wherever pressurized staircase is to be connected to unpressurized area, the two areas should be segregated by 120 minutes fire resistant wall.

h) Fresh air intake for pressurization should be away (at least 4 m) from any of the exhaust outlets/grille.

TABLE 7

PRESSURIZATION OF STAIRCASES AND LIFT LOBBIES

Sl No.	Component	Height of the Building		
		Less than 15 m	15 m to 30 m	More than 30 m
(1)	(2)	(3)	(4)	(5)
1	Internal staircase not with external wall	Pressurized except for residential buildings (apartment houses and one- or two-family dwellings)	Pressurized	Pressurized
2	Internal staircase with external wall	Pressurized except for residential buildings (Apartment houses and one- or two-family dwellings) or Naturally ventilated	Naturally ventilated or Pressurized	Cross-ventilated or Pressurized
3	Lift lobby	Not required at ground and above. However, lift lobby segregation and pressurization is required for lift commuting from ground to basement	Naturally ventilated or Pressurized**1)**	Cross-ventilated or Pressurized**1)**

NOTES

a) The natural ventilation requirement of the staircase should be achieved through opening at each landing, of an area 0.5 m2 to 1.5 m2 (as defined earlier) in the external wall. A cross ventilated staircase should have 2 such openings in opposite/adjacent walls or the same should be cross ventilated through the corridor.

b) Enclosed staircase leading to more than one basement should be pressurized.

1) Lift lobby with fire doors (120 minutes) at all levels with pressurization of 25 Pa to 30 Pa is required. However, if lift lobby cannot be provided at any of the levels in air-conditioned buildings or in internal spaces where funnel/flue effect may be created, lift hoist way should be pressurized at 50 Pa. For building greater than 30 m, multiple point injection air inlets to maintain desired pressurization level should be provided. If the lift lobby, lift, and staircase are part of firefighting shaft, lift lobby necessarily has to be pressurized in such case, unless naturally ventilated.

3.5. Compartmentation

3.5.1. General

It is important to limit the spread of a fire in special/high rise buildings, usually through the use fire barriers. In some instances, these barriers need to be penetrated for ductwork, plumbing and electrical systems, and in such cases, use of passive fire protection measures should be done so that the integrity of these barriers is not compromised.

3.5.1.1. All critical utility rooms within each compartment area construction should be 2 h fire rated. Rooms such as electrical room, server room, uninterrupted power supply (UPS) room, battery room, lift machine rooms, IT networking room, main distribution frame (MDF), intermediate

distribution frame (HUB/IDF rooms), main communication room (MCR room), network switch rooms, multiplexer (MUX) rooms, telecom equipment room, janitor storage room, chemical storage room, QA and QC laboratories, etc, should be enclosed from all sides and construction should be 2 h fire rated irrespective of the size/area.

3.5.1.2. Guest rooms, guest room corridors, banquets, should be 60 minutes fire compartmented with 30 minutes fire rated doors.

3.5.1.3. In buildings with open atrium, the effect of compartmentation on the atrium should be disregarded.

3.5.1.4. In industrial and storage occupancies, all hazardous areas irrespective of area/size should be compartmented namely, vehicle charging areas, ignitable chemical storage areas, hazardous waste storage areas, flammable scrap storage areas, unless these are located 30 m away from any adjacent occupied buildings.

3.5.1.5. All live cooking areas with any type of fuel (induction, LPG, PNG, etc) in hotels, IT parks, business buildings cafeteria, hostels, educational facility, food courts, malls, any commercial kitchens should be 120 minutes fire rated segregated from other areas.

3.6. Smoke Control

3.6.1. Smoke Exhaust and Pressurization of Areas Above Ground

Corridors in exit access (exit access corridor) are created for meeting the requirement of use, privacy, and layout in various occupancies. These are most often noted in hospitality, health care occupancies and sleeping accommodations.

Exit access corridors of guest rooms and indoor patient department/areas having patients lacking self-preservation and for sleeping accommodations such as service apartments, custodial, penal, and mental institutions, etc, should be provided with 60 minutes fire resistant wall and 30 minutes self-closing fire doors along with all fire stop sealing of penetrations.

Smoke exhaust system having make-up air and exhaust air system or alternatively pressurization system with supply air system for these exit access corridors should be required.

Smoke exhaust system having make-up air and exhaust air system should also be required for theatres/auditoria. Such smoke exhaust system should also be required for large lobbies and which have exit through staircase leading to exit discharge. This would enable eased exit of people through smoke-controlled area to exit discharge. All exit passageway (from exit-to-exit discharge) should be pressurized or naturally ventilated. The mechanical pressurization system should be automatic in action with manual controls in addition. All such exit passageway should be maintained with integrity for safe means of egress and evacuation. Doors provided in such exit passageway should be fire rated doors of 120 minutes rating.

Smoke exhaust system where provided, for above areas and occupancies should have a minimum of 12 air changes per hour smoke exhaust mechanism.

Pressurization system where provided, should have a minimum pressure differential of 25-30 Pa in relationship to other areas.

The smoke exhaust fans in the mechanical ventilation system should be fire rated, that is, 250°C for 120 minutes. For naturally cross-ventilated corridors or corridors with operable windows, such smoke exhaust system or pressurization system will not be required.

3.6.2. Smoke Exhaust and Pressurization of Areas Below Ground

a) Each basement should be separately ventilated;

b) Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement should be provided in the form of grilles, or breakable stall board lights or pavement lights or by way of shafts.

Alternatively, a system of mechanical ventilation system may be provided. Mechanical ventilation system should be designed to permit 12 air changes per hour (ACPH) in case of fire or distress call. In case of single basement, fresh-air may be considered from ramp and perimeter opening to achieve 12 ACPH ventilation requirement.

c) In multi-level basements, independent air intake and smoke exhaust shafts (masonry or reinforced concrete) for respective basement levels and compartments therein should be planned with its make-up air and exhaust air fans located on the respective level and in the respective compartment. Alternatively, in multi-level basements, common intake masonry (or reinforced cement concrete) shaft may serve respective compartments aligned at all basement levels. Similarly, common smoke exhaust/outlet masonry (or reinforced cement concrete) shafts may also be planned to serve such compartments at all basement levels. All supply air and exhaust air fans on respective levels should be installed in fire resisting room of 120 minutes. Exhaust fans at the respective levels should be provided with back draft damper connection to the common smoke exhaust shaft ensuring complete isolation and compartmentation of floor isolation to eliminate spread of fire and smoke to the other compartments/floors.

d) Due consideration should be taken for ensuring proper drainage of such shafts to avoid insanitation condition. Inlets and extracts may be terminated at ground level with stall board or pavement lights as before. Stall board and pavement lights should be in positions easily accessible to the fire brigade and clearly marked 'AIR INLET' or 'SMOKE OUTLET' with an indication of area served at or near the opening.

e) Smoke from any fire in the basement should not obstruct any fire exit serving the ground and upper floors of the building.

f) The smoke exhaust fans in the mechanical ventilation system should be fire rated, that is, 250 °C for 120 minutes.

g) The smoke ventilation of the basement car parking areas should be through provision of supply and exhaust air ducts duly installed with its supports and connected to supply air and exhaust fans. Alternatively, a system of impulse fans (jet fans) may be used for meeting the requirement of smoke ventilation complying with the following:

1) Structural aspects of beams and other down stands/services should be taken care of in the planning and provision of the jet fans.
2) Fans should be fire rated, that is, 250 °C for 120 minutes.
3) Fans should be adequately supported to enable operations for the duration as above.
4) Power supply panels for the fans should be located in fire safe zone to ensure continuity of power supply.
5) Power supply cabling should meet circuit integrity requirement in accordance with accepted standard [F(13)].

The smoke extraction system should operate on actuation of flow switch actuation of sprinkler system. In addition, a local and/or remote 'manual start-stop control/switch' should be provided for operations by the fire fighters.

Visual indication of the operation status of the fans should also be provided with the remote control. No system relating to smoke ventilation should be allowed to interface or cross the transformer area, electrical switchboard, electrical rooms or exits.

Smoke exhaust system having make-up air and exhaust air system for areas other than car parking should be required for common areas and exit access corridor in basements/underground structures and should be completely separate and independent of car parking areas and other mechanical areas. Supply air should not be less than 5 m from any exhaust discharge openings.

3.7. Gas Supply

3.7.1. Town Gas/LPG Supply Pipes

Where gas pipes are run in buildings, the same should be run in separate shafts exclusively for this purpose and these should be on external walls, away from the staircases. Gas distribution pipes should always be below the false ceiling. The length of these pipes should be as short as possible. In the case of kitchen cooking range area, hood should have grease filters using metallic grille to trap oil vapours escaping into the fume hood.

3.7.2. **Thermal Detectors:** These should be installed into fume hoods of large kitchens for hotels, hospitals, and similar areas located in high rise buildings. Arrangements should be made for automatic tripping of the exhaust fan in case of fire. If gas is used, the same should be shut off. The voltage should be 24 V or 100 V d.c. operated with external rectifier. The valve should be of the hand re-set type and should be located in an area segregated from cooking ranges. Valves should be easily accessible. The hood should have manual facility for steam or suitable hood extinguishing gas released depending on duty condition.

3.7.3. Gas cylinders and manifold should need to be housed in a detached location with no other occupancy within distances prescribed in good practice [F(14)] thereof. There should be an enclosure suitably ventilated. It is desirable to provide medium velocity spray nozzles which can be operated by quick opening valve situated away from the enclosure.

3.7.4. In the case of gas cylinders, if manifold has to be installed on podium/close to podium, the same should be away from any air intakes/smoke exhaust openings/any windows.

3.7.5. Pressure regulating stations should be designed and installed at critical locations for excess flow shut off valves. Seismic shut off valve at the main distribution point should be installed for buildings having mixed use assembly occupancy (like malls) and institutional occupancy above 15 m.

3.7.6. Gas meters should be housed in a suitably constructed metal cupboard located in a well-ventilated space, keeping in view the fact that LPG is heavier than air and natural gas is lighter than air.

3.7.7. Wherever LPG reticulation/cylinders are used in buildings above 100 m, gas leak detectors should be provided at the usage points and monitored from fire command centre. The cables used for signalling should be circuit integrity cables.

3.7.8. The gas lines should not be installed through any enclosed staircase or electrical shafts, escape routes, refuge areas/refuge floors.

3.7.9. Kitchens working on LPG fuel should not be permitted in basements. Small kitchen using ıer than LPG fuel, such as induction/PNG/electricity-based, may be permitted in incidental occupancies in the basement.

3.8. Hazardous Areas, Gaseous, Oil Storage Yard, etc

Rooms containing high pressure boilers, refrigerating machinery, transformers, or other service equipment subject to possible explosion should not be located directly under or adjacent to fire exits. All such rooms should be effectively cut-off from other parts of the building and should be provided with adequate vents to the outside air.

All rooms or areas of high hazard in additions to those hereinbefore mentioned, should be segregated, or should be protected with fire resistant walls having fire rating of 120 minutes as fire, explosion or smoke therefrom is likely to interfere with safe egress from the building. Further,

a) each building should be provided with an approved outside gas shut-off valve conspicuously marked; and
b) all exterior openings in a boiler room or rooms that contain central heating equipment, if located below opening in another storey or if less than 3 m from other doors or windows of the same building should be protected by a fire assembly. Such assemblies should be fixed, automatic or self-closing.

3.9. Fire Detection and Alarm

a) The requirements of fire detection and alarm systems are covered for each occupancy in Table 8A to Table 8J for annunciation to occupants in view of the ensuing vulnerability and to warn occupants early of the existence of fire, so as to facilitate orderly and safe egress;
b) Fire detection and alarm systems in buildings should be so planned and programmed so as to enable operations of various systems and equipment to facilitate requirements leading to life safety, compartmentation and fire protection. These systems and equipment may include electromechanical systems such as air handling units; pressurization systems; smoke management systems; creation of compartmentation through the release ~~of fire barrier; hold-up fire doors; etc; and monitoring of fire water storage tanks and pumps;~~ pressures in hydrant and sprinkler system, etc. These planning and requirements should be based on building occupancy and other requirements on case-to-case basis;
c) Voice evacuation systems should employ English, Hindi and vernacular language using pre-recorded messages and integrate with fire alarm panels for alerting the zone of fire and surrounding zones/floors as required for annunciation (see also Table 8A to Table 8J);
d) Appropriate visual warning arrangement through visual strobes/beacons may be considered in appropriate situations particularly in public buildings, at required locations to ensure visual as well as alarm for persons with hearing impairment;
e) For assembly buildings, institutional buildings and all buildings above 30 m in height where fire alarm system is provided in accordance to Table 8A to Table 8J, detectors should also be provided inside the electrical shafts, lift machine rooms, etc, besides occupancy areas;
f) Fire alarm panels should be connected in peer-to-peer network or with redundant cables, run in different shafts. Each panel should be able to work in standalone mode and master slave architecture may be used where required;

g) The fire detection system should be in accordance with accepted standards [F(15)];

h) Guidelines for selection of various types of fire detectors for different occupancies and their installation and maintenance should be in accordance with good practice [F(16)]. See also Handbook for 'Asset and Facility Management' for guidance;

i) In buildings where automatic fire alarm system is provided, the following should be monitored from fire alarm panel:

1) Water level in all tanks.
2) Hydrant and sprinkler pressures of respective zones, as provided.
3) Pump 'ON/OFF' status.
4) All isolation valves, wherever provided with supervisory switch (non-padlock valves).
5) Other requirements to meet electro-mechanical services interface.

REQUIREMENTS FOR FIREFIGHTING INSTALLATIONS

TABLE – 8A

FOR RESIDENTIAL BUILDINGS

RESIDENTIAL BUILDINGS (A)									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
a)	**Lodging and Rooming Houses (A- I)**	**Up to 750 m2 floor area and up to 24 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1)	**24 m and above in height and, having any area Or Less than 24 m in height but of area,**								
i)	floor area on any single floor 751 m2 to 1000 m2 (HL-1) **See Notes 1, 2, 3 and 4**	R	R	NR	NR	NR	NR	R	NR
ii)	1001 m2 and above (HL-2) **See Notes 2, 3 and 4**	R	R	R	NR	NR	NR	R	R
b)	**Dormitories (A-II)**	**Up to 750 m2 floor area and up to 24 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1)	751 m2 to 1 000 m2 (HL-1) **See Notes 1, 2, 3 and 4**	R	R	NR	NR	NR	NR	NR	NR
2)	1 001 m2 and above (HL-2) **See Notes 2, 3 and 4**	R	R	R	NR	NR	NR	R	NR
c)	**Apartment Houses (A-III)**	**Up to 750 m2 floor area and up to 24 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1)	**24 m and above but not exceeding 60 m in height; and, height less than 24 m, but of area:**								
i)	751 m2 to 1 000 m2 (HL-2) **See Notes 2, 3, 4, 7 and 9**	R	R	R	NR	NR	NR	NR	NR

ii)	1 001 m2 and above (HL-3) **See Notes 2, 3, 4, 5, 7, 9 and 10**	R	R	NR	R	R	NR	R	R
2)	Above 60 m height (CL-4) **See Notes 3, 4, 5, 7, 8, 9, and 10**	R	R	NR	R	R	R	R	R

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24 × 7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 24 m where HL Protection is required as per above Table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. If the building has kitchen, the protection level will be HL-2.
2. If the building has basement to be protected with sprinklers, the protection level should comply with CL-3.
3. If the building has electrical vehicles (EV) parks in podium or basements, it should be protected with sprinklers and complying to CL-5.
4. Rate of rise of heat sensor/detection system should be provided in EV (Electrical Vehicles) parks and charging areas. Smoke sensor/detectors should be provided in all basements in all areas other than internal combustion engine (ICE) vehicles parks as part of the fire alarm system. ICE vehicle parks should be provided with carbon monoxide sensors as part of fire alarm system to activate ventilation system.
5. If the building height exceeds 60 m the hydraulic calculations meeting recommended system architecture with multi-level pumping and storage with gravity redundant down comer may be considered. The pumps considered should not exceed 12 bar shutoff pressure.
6. Pump pressure and quantity should be supported by hydraulic calculations.
7. 2,500 lpm at 10 bar common pumping and water storage of 2,55,000 litre should be provided for a cluster of maximum 5 buildings, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for EV parking and or charging facilities, the protection level should comply with CL-5.
8. Multi-level pumping and water storage as per schematic line drawing (SLD) may be considered for cluster buildings more than 45 m in height; and water storage at every 45 m above should be provided for individual buildings.
9. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.
10. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered.

TABLE – 8B

FOR EDUCATIONAL BUILDINGS

EDUCATIONAL BUILDINGS (B)									
Sl No	Type of Building Occupancy	Fire Extinguisher	First Aid Hose Reel	Down Comer	Wet Riser	Yard Hydrant	Automatic Sprinkler System	Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector	Public Address and Voice Evacuation System
Up to 500 m2 floor area and up to 12.50 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable									
1)	**9 m and above but not exceeding 45 m; And, height less than 12.50 m, but of area:**								
i)	501 m2 to 1 000 m2 (HL-3) **See Notes 1, 2, 3, 5, 7 and 9**	R	R	NR	R	R	NR	R	R
ii)	1 001 m2 and above (CL-4) **See Notes 3, 5, 7, 9 and 10**	R	R	NR	R	R	R	R	R
2)	45 m and above but not exceeding 60 m in height (CL-4) **(See Notes 5, 6, 7, 8, 9 and 10)**	R	R	NR	R	R	R	R	R
3)	Above 60 m – **See Note 5**	If the building height exceeds 60 m the hydraulic calculations meeting recommended system architecture with multi-level pumping and storage with gravity redundant down comer may be considered. The pumps considered should not exceed 12 bar shutoff pressure.							

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24 × 7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 9 m where HL Protection is required as per above Table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. If there are laboratories, AV/computer rooms, auditoriums, they should be protected with sprinkler, and the protection level should comply with CL-3.
2. If the building has basement to be protected with sprinklers, the protection level should comply with CL-3.
3. If the building has electrical vehicles (EV) parks in podium or basements, it should be protected with sprinklers and complying to CL-5.
4. Rate of rise heat sensor/detection system should be provided in Electrical Vehicles (EV) parks and charging areas. Smoke sensor/detectors should be provided in all basements in all areas other than internal combustion engine (ICE) vehicles parks as part of the fire alarm system. ICE vehicle parks should be provided with carbon monoxide sensors as part of fire alarm system to activate ventilation system.
5. If the building height exceeds 60 m the hydraulic calculations meeting recommended system architecture with multi-level pumping and storage with gravity redundant down comer may be considered. The pumps considered should not exceed 12 bar shutoff pressure.
6. Pump pressure and quantity should be supported by hydraulic calculations
7. 2,500 lpm at 10 bar common pumping and water storage of 2,55,000 litre should be provided for a cluster of maximum 5 buildings, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for EV parking and or charging facilities, the protection level should comply with CL-5.
8. Multi-level Pumping and water storage as per schematic line drawing (SLD) may be considered for cluster buildings more than 45 m; and water storage at every 45 m above should be provided for individual buildings.

9. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provi 1. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.
10. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered

TABLE – 8C
FOR INSTITUTIONAL BUILDINGS

INSTITUTIONAL BUILDINGS (C)									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
a)	**Nursing homes and sanatoria**	**Up to 500 m2 floor area and up to 15 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1)	(see Note 1) Building height above 15 m; and, for heights up to 15 m, and area 501 m2 and above (HL-3) See Notes 1, 2, 4, 6 and 9	R	R	R	NR	NR	NR	R	NR
b)	**Hospitals (C-I)**	**Up to 500 m2 floor area and up to 15 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1	For heights not exceeding 45 m in height								
i)	501 m2 to 1 000 m2 (CL-3) See Notes 2, 4, 6, 7, 9 and 10	R	R	NR	R	R	R	R	NR
ii)	Above 1 001 m2 (CL-4) See Notes 2, 4, 6, 7, 9 and 10	R	R	NR	R	R	R	R	R
2	exceeding 60 m in height (CL-5) See Notes 4, 6, 7, 9 and 10	R	R	NR	R	R	R	R	R
3	Above 60 m – See Note 3								
c)	**Custodial, Penal and Mental Institutions (C-II and III)**	**Up to 500 m2 floor area and up to 15 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1	For heights not exceeding 45 m in height								
i)	501 m2 to 1 000 m2 (HL-2) See Notes 1, 2, 4 and 6	R	R	R	NR	NR	NR	NR	R
ii)	1 001 m2 and above (HL-3) See Notes 1, 2, 4, 6 and 9	R	R	NR	R	R	NR	R	R
2	Above 45 m (HL-4) See Notes 1, 2, 3, 6, 8 and 9	R	R	NR	R	R	NR	R	R

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24 × 7 uninterrupted, such states/areas/jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 15 m where HL Protection is required as per above Table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. Basement area or storage of oxygen or any medical gases or any gas fuel, laundry or linen/waste, transformer/HT rooms within the building foot print or in basement should be protected with sprinkler and the protection level should comply with CL-3.
2. If the building has electrical vehicles (EV) parks in podium or basements, it should be protected with sprinklers and complying to CL-5.
3. If the building height exceeds 60 m the hydraulic calculations meeting recommended system architecture with multi-level pumping and storage with gravity redundant down comer may be considered. The pumps considered should not exceed 12 bar shutoff pressure.
4. Protection should comply to supplementary protection for specific hazard/critical rooms as per Table 9/ Table 10/ Table 11 as applicable.
5. Pump pressure and quantity should be supported by hydraulic calculations.
6. Rate of rise heat sensor/detection system should be provided in electrical vehicles (EV) parks and charging areas. Smoke sensor/detectors should be provided in all basements in all areas other than internal combustion engine (ICE) vehicles parks as part of the fire alarm system. ICE vehicle parks should be provided with carbon monoxide sensors as part of fire alarm system to activate ventilation system. (recommendation only for parking and podium)
7. 3785/2500 lpm at 10 bar common pumping and water storage of 3,50,000/2,55,000 litre should be provided of cluster of maximum 5 building 45 m height, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for Electric Vehicles (EV) parking and or charging facilities, the protection level should comply with CL-5.
8. Multi-level pumping and water storage as per schematic line drawing (SLD) may be considered for cluster buildings more than 45 m; and water storage at every 45 m above should be provided for individual buildings.
9. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.
10. If the building height exceeds 30 m it should comply hydraulic calculations meeting recommended system architecture.
11. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered.

TABLE – 8D

FOR ASSEMBLY BUILDINGS

ASSEMBLY BUILDINGS (D) See Note 4									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
a)	**Assembly Buildings**	**Up to 750 m2 floor area and up to 12.50 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1	12.50 m and above but not exceeding 15 m in height; and, for heights less than 12.50 m; and area See Note 6								
i)	751 m2 to 1 000 m2 (HL-3) See Notes 1, 2, 3, 5 and 8	R	R	NR	R	NR	NR	R	NR
ii)	1 001 m2 and above (CL-4) See Notes 2, 5, 8 and 9	R	R	NR	R	R	R	R	NR
2	Above 15 m in height (CL-4) See Notes 2, 5, 6, 7, 8 and 9	R	R	NR	R	R	R	R	NR

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24×7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping

with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient tempe ure below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 24 m where HL Protection is required as per above Table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. If the building has basement to be protected with sprinklers, the protection level should comply with CL-3.
2. If the building has electrical vehicles (EV) parks in podium or basements, it should be protected with sprinklers and complying to CL-5.
3. Live cooking kitchens, boiler/furnace rooms, laundry or linen/waste rooms, transformer/HT rooms within the building foot print or in basement the area should be protected with sprinkler protection and should comply with CL-4.
4. Pump pressure and quantity should be supported by hydraulic calculations.
5. Rate of rise heat sensor/detection system should be provided in electrical vehicles (EV) parks and charging areas. Smoke sensor/detectors should be provided in all basements in all areas other than internal combustion engine (ICE) vehicles parks as part of the fire alarm system. ICE vehicle parks should be provided with carbon monoxide sensors as part of fire alarm system to activate ventilation system. (recommendation only for parking and podium).
6. 2,500 lpm at 10 bar common pumping and water storage of 2,55,000 litre should be provided for a cluster of maximum 5 buildings, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for EV parking and or charging facilities, the protection level should comply with CL-5.
7. Multi-level pumping and water storage as per schematic line drawing (SLD) may be considered for cluster buildings more than 45 m; and water storage at every 45 m above should be provided for individual buildings.
8. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.
9. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered

TABLE – 8E

FOR BUSINESS BUILDINGS

BUSINESS BUILDINGS (E) See Notes 5									
Sl No	Type of Building Occupancy	Fire Extinguisher	First Aid Hose Reel	Down Comer	Wet Riser	Yard Hydrant	Automatic Sprinkler System	Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector	Public Address and Voice Evacuation System
a)	**Business Buildings (Human Occupied)**	**Up to 750 m2 floor area and up to 15 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1	15 m and above but not exceeding 45 m in height; and, for heights less than 15 m and area								
i)	751 m2 to 1 000 m2 (CL-2) See Notes 1, 2, 3, 6, 7, 9 and 11	R	R	R	NR	NR	R	R	R
ii)	1 001 m2 to 3 000 m2 (CL-3) See Notes 2, 3, 6, 7, 9 and 11	R	R	NR	R	R	R	R	R
iii)	3 001 m2 and above (CL-4) See Notes 2, 3, 6, 7, 9 and 11	R	R	NR	R	R	R	R	R
2	Above 45 m but not exceeding 60 m height (CL-5) See Notes 3, 4, 6, 7, 8, 9 and 11	R	R	NR	R	R	R	R	R
3	For buildings over 60 m height	See Note 4							

b)	**Data Centres (Machine Environment) See Notes 3, 12 ,13 and 15**								
1	Less than 15 m in height								
i)	Floor Area on any single floor up to 1000 m2	R	R	NR	R	R	R	R	R
ii)	1 001 m2 and above	R	R	NR	R	R	R	R	R
2	Above 15 m in height								
i)	Floor Area on any single floor up to 1000 m2	R	R	NR	R	R	R	R	R
ii)	1 001 m2 and above	R	R	NR	R	R	R	R	R

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24 × 7 uninterrupted, such states/areas/jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 15 m where HL protection is required as per above table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. If the building has basement to be protected with sprinklers, the protection level should comply with CL-3.
2. If the building has Electrical Vehicles (EV) parks in podium or basements, it should be protected with sprinklers and complying to CL-5.
3. Protection should comply to supplementary protection for specific hazard/critical rooms as per Table 9/ Table 10/ Table 11 as applicable.
4. If the building height exceeds 60 m the hydraulic calculations meeting recommended system architecture with multi-level pumping and storage with gravity redundant down comer may be considered. The pumps considered should not exceed 12 bar shutoff pressure.

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant

5. Pump pressure and quantity should be supported by hydraulic calculations.
6. 2500 lpm at 10 bar common pumping and water storage of 2,55,000 litre should be provided for a cluster of maximum 5 buildings, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for EV parking and or charging facilities, the protection level should comply with CL-5.
7. 3785 lpm at 10 bar common pumping and water storage of 3,50,000 litre should be provided of cluster of maximum 5 building, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for Electric Vehicles (EV) parking and or charging facilities, the protection level should comply with CL-5.
8. Multi-level pumping and water storage as per schematic line drawing (SLD) (see Fig. 20) may be considered for cluster buildings more than 45 m; and water storage at every 45 m above should be provided for individual buildings.
9. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.
10. The entire building it should be protected with sprinkler and the protection level should comply with CL-5. IT/Data Hall should be protected with suitable clean agent gas suppression only if the racks are without BBU (not exceeding 20 kWh backup battery units).
11. All internet data centres or hyper scales or colocation data centres comply with protection level CL6.
12. If the IT/data hall (DC) racks are with BBUs with Lithium-ion batteries not exceeding 20 kWh/rack, wet or dry sprinkler/pre-action/water mist (3rd party tested for lithium ion BBUs) should be deployed. If the BBUs exceed 20 kWh/rack, water mist should not be installed.
13. If the cluster of data centre buildings to a maximum of 3, common pumping system and storage may be with an additional diesel engine pump, with double water storage.
14. If the any of the building houses lithium-ion energy storage systems exceeding 600 kWh/floor, the building should comply to protection level CL-6.
15. Lithium-ion battery energy storage systems (BESS) room should be protected with wet/single interlock pre action sprinkler only, considering entire room as "assumed area of operation". Pump and water storage should be calculated based on maximum design and hydraulic calculations whichever is higher.

16. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for com ned (sprinkler and hose) protection and hose protection be considered.	
1	Above 15 m but not exceeding 30 m in height; and, for heights less than 15 m and area

TABLE – 8F
FOR MERCANTILE BUILDINGS

MERCANTILE BUILDINGS (F) See Note 4									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
a)	**Mercantile Buildings (F)**	**Up to 750 m2 floor area and up to 15 m height (both conditions to be met), self-certification by a Qualified Agency should be treated acceptable**							
1	Above 15 m but not exceeding 30 m in height; and, for heights less than 15 m and area								
i)	751 m2 and above (CL-4) See Notes 2, 3, 5, 6, 7 and 8	R	R	NR	R	R	R	R	NR
2	Above 30 m	See Note 5							
b)	**Underground Shopping Complex (CL-5) See Note 3**	R	R	NR	R	R	R	R	R
c)	**Hotels (A-IV)**	**Up to 750 m2 floor area and up to 15 m height (both conditions to be met), self-certification by Qualified Agency should be treated acceptable**							
1)	**Up to 24 m in height, but of area:**								
i)	751 m2 to 1 000 m2 (HL-3) See Notes 1, 2, 7, 9 and 11	R	R	R	NR	NR	NR	R	NR
ii)	1 001 m2 and above (CL-3) See Notes 2, 7, 9 and 11	R	R	NR	R	NR	R	R	R
iii)	**24 m and above but not exceeding 60 m in height OR 3/4 Star Hotels (CL-4)** See Notes 2, 5, 6, 7, 9, 10 and 11	R	R	NR	R	R	R	R	R
iv)	Above 60 m – **See Note 5,6**								
d)	**Starred (Franchise – 5 Star) Hotels (A-V)**								
1)	Up to 60 m (CL-5) **See Note 9**	R	R	NR	R	R	R	R	R
2)	Above 60 m – **See Note 5,6**								

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24 × 7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 15 m where HL Protection is required as per above table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. If the building has basement to be protected with sprinklers, the protection level should comply with CL-3.
2. If the building has electrical vehicles (EV) parks in podium or basements, it should be protected with sprinklers and complying to CL-5.
3. Protection should comply to supplementary protection for specific hazard/critical rooms as per Table 9/ Table 10/ Table 11 as applicable.
4. Pump pressure and quantity should be supported by hydraulic calculations.
5. If the building height exceeds 30 m it should comply hydraulic calculations meeting recommended system architecture.
6. If the building height exceeds 60 m multi-level pumping and storage with gravity redundant down comer. The pumps considered should not exceed 12 bar shutoff pressure.
7. Rate of rise heat sensor/detection system should be provided in electrical vehicles (EV) parks and charging areas. Smoke sensor/detectors should be provided in all basements in all areas other than internal combustion engine (ICE) vehicles parks as part of the fire alarm system. ICE vehicles parks should be provided with carbon monoxide sensors as part of fire alarm system to activate ventilation system.
8. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered.
9. 2,500 lpm at 10 bar common pumping and water storage of 2,55,000 litre should be provided for a cluster of maximum 5 buildings, with or without common basement. The buildings should not be closer than 9 m. If the buildings are closer than 9 m, or the basement is used for EV parking and or charging facilities, the protection level should comply with CL-5.
10. Multi-level pumping and water storage as per schematic line drawing (SLD) may be considered for cluster buildings more than 45 m in height; and water storage at every 45 m above should be provided for individual buildings.
11. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.

TABLE – 8G
FOR INDUSTRIAL BUILDINGS

Industrial Buildings (G) See Note 5									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
a)	**Low Hazard (G-1) See Notes 1 and 6**								
i)	Built up area up to 1000 m2 (Including the MSMEs) (HL-1)	R	R	NR	NR	NR	NR	NR	NR
ii)	Built up area from 1001 m2 to 2000 m2 (HL-2)	R	R	R	NR	NR	NR	NR	NR
iii)	Built up area from 2001 m2 up to 3000 m2 (HL-3)	R	R	NR	NR	R	NR	R	NR
iv)	Above 3 001 m2 (HL-4) See Note 1	R	R	NR	NR	R	NR	R	NR
b)	**Moderate Hazard (G-2) See Notes 1, 4 and 6**								
i)	Built up area up to 500 m2 (HL-2)	R	R	R	NR	NR	NR	NR	NR
ii)	Built up area from 501 m2 to 2 000 m2 (HL-3)	R	R	NR	R	R	NR	R	NR

iii)	Built up area from 2 001 m2 to 3 000 m2 (HL-4)	R	R	NR	R	R	NR	R	NR
iv)	Built up area above 3 001 m2 (CL-5)	R	R	NR	R	R	R	R	NR
c)	**High Hazard (G- 3)**								
i)	Built up area up to 250 m2 (CL-4) See Notes 1, 2, 3 and 7	R	R	NR	R	R	R	NR	NR
ii)	Built up area from 251 m2 to 1 000 m2 (CL-5) See Notes 1, 2, 3, 4 and 7	R	R	NR	R	R	R	R	NR
iii)	Built up area above 1 001 m2 (CL-6) See Notes 2, 3, 4 and 7	R	R	NR	R	R	R	R	R

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24×7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings area where HL Protection is required as per above Table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. If the building has any type of combustible storage, combustible packing, fuel storage, boilers, furnaces such areas should be protected and should comply to protection level CL-6.
2. Alternate suppression agent should be considered as per relevant Indian Standards if water is not a suitable agent for materials protected.
3. Oxidizing materials, ignitable liquids, water resistive chemicals, explosives, aluminium dust, or any other explosive environment should be treated separately.
4. Protection should comply to supplementary protection for specific hazard/critical rooms as per Table 9/ Table 10/ Table 11 as applicable.
5. Pump pressure and quantity should be supported by hydraulic calculations.
6. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point.
7. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered.

TABLE – 8H
FOR STORAGE BUILDINGS

Storage Buildings (H) (See Note 1, 2 and 3)									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
i)	Built-up area up to 500 m2 (HL-4)	R	R	NR	R	NR	NR	R	NR
ii)	501 m2 to 1 000 m2 (HL-5)	R	R	NR	R	R	NR	R	NR

iii)	1 001 m2 to 2 000 m2 or building ridge height up to 7.6 m (CL-6)	R	R	R	NR	R	R	R	NR
iv)	Above 2 001 m2 or Building ridge height above 7.6 m and up to 9.0 m (CL-7)	R	R	NR	R	R	R	R	R
v)	Building of any height with rack storage	R	R	NR	R	R	R	R	R

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with hydrant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24×7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings area where HL Protection is required as per above table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. Pump pressure mentioned in above table is considering minimum requirement, it should be supported hydraulic calculations. The above Table applies to the below Storage categories only, stored on ground, not exceeding 3.7 m, (12 feet) excluding tyre storage. In addition, they should also comply with supplementary protection for all hazard/critical rooms as per Table 9/Table 10/ Table 11:
   a) Packaging materials stored on ground with or without pallets
   b) Raw materials storage, in solid pile, shelves, pallets
   c) Finished goods storage, solid pile, shelves, pallets
   d) Miscellaneous storage in and around manufacturing/assembly/packaging areas
   e) Retail storage in shelves other than catwalk storage
2. For rack storages, with plastic/combustible packaging (exposed/cartoned unexpanded or exposed/ cartoned expanded), water reactive solids/liquid storages, lithium battery storages, ignitable chemical storages, or retail cat walk, any other oxidizing agent storages, relevant Indian Standards should be followed, and pumping capacities and water storage should be justified by way of hydraulic calculations.
3. If the cluster of buildings exceeds 5, another set of pumps and water storage of similar capacity should be provided. A maximum of two such sets is recommended, provided it satisfies the hydraulic requirements and functioning at the remotest point
4. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered.

TABLE – 8J
FOR HAZARDOUS BUILDINGS

Hazardous Buildings (J) (See Notes 1 and 2)									
Sl No	**Type of Building Occupancy**	**Fire Extinguisher**	**First Aid Hose Reel**	**Down Comer**	**Wet Riser**	**Yard Hydrant**	**Automatic Sprinkler System**	**Automatic Fire Detection and Alarm System and LPG/PNG Gas Detector**	**Public Address and Voice Evacuation System**
1	Up to 15 m in Height								
i)	Single storey building (CL-7)	R	R	NR	R	R	R	R	NR
ii)	More than one floor building but not exceeding 15 m (CL-8)	R	R	NR	R	R	R	R	R

REMARK 1: Any state or area where the municipal supply caters to municipal/public yard hydrant system with h[illegible]ant outlets provided throughout the premises with adequate water supply meeting the wet riser requirement demand flow and pressure 24 × 7 uninterrupted, such states/areas/ jurisdiction can replace the wet riser system and its associated pumping with water storage with a dry riser system. Dry riser system is also recommended for areas where ambient temperature below is 4 °C and has facility of connecting the yard hydrant to the dry riser in any event of fire in the building. This system is to be maintained with quarterly checks to ensure the system integrity to handle the required flow and pressure. This is applicable for buildings height only up to 15 m where HL Protection is required as per above Table.

REMARK 2: Sharing of water storage tank may be permitted between the adjacent neighbouring properties including industry clusters, without any loss of hydraulic effects (which is essential to fight the fire during an emergency).

NOTES

1. These buildings should deploy specific tailor-made systems and solutions in terms of water hydrant/sprinklers, dry chemical, dry powder, water mist, gas/ wet chemical suppression, foam or/and any other as per relevant Indian Standards and international standards (wherever Indian Standards are not available) in consultation with local fire services or Authority having Jurisdiction (AHJ).
2. Pump pressure and quantity should be supported by hydraulic calculations.
3. Table 8K and Table 8M suggesting the basis for water quantity required for fire-fighting, respectively for combined (sprinkler and hose) protection and hose protection be considered.

TABLE 8K

BASE CALCULATIONS FOR COMBINED PROTECTION SYSTEM (SPRINKLER SYSTEM AND HOSE STREAM)

Sl No	Combined System	Hazard Classification	Sprinkler Density	Sprinkler Area	Hose Stream Flow @3.5 bar	No. of Hose Streams	Pump Capacity and Quantity	Duration (min)
i	Level of Protection – CL-1	Extra Low Hazard -1	2.25	84	50	2	379 lpm x 1	30–60
ii	Level of Protection – CL-2	Extra Low Hazard -2	4.1	140	170	2	946 lpm x 1	30–60
iii	Level of Protection – CL-3	Low Hazard	6.1	230	285	3	1,892 lpm x 1	30–60
iv	Level of Protection – CL-4	Moderate Hazard -1	8.1	230	285	3	2,500 lpm x 1	60–120
v	Level of Protection – CL-5	Moderate Hazard -2	12.2	230	475	3	3,785 lpm x 1	60–120
vi	Level of Protection – CL-6	Extra Hazard -1	16.3	230	475	3	4,731 lpm x 1	60–120
vii	Level of Protection – CL-7	Extra Hazard -2	18.3	280	670	4	7,570 lpm x 1	60–120
viii	Level of Protection – CL-8	High Hazard	24.5	280	1050	4	4731 lpm x 2	60–120

Pump capacity = Total flow with 20 percent overflow and operating at 140 percent capacity.
For example, for CL-5, capacity will be (12.2 × 230) + (475 × 3) = 4 231 litre; with overflow margin works to 5 077.2 litre; and pump selection will be 5 077.2/140*100 = 3 627 lpm (and the nearest Indian Standard pump is 3 785 lpm).

NOTES

1. 'Pump' implies, providing an electric pump and 'Standby pump of equivalent capacity'. For loss in pressure, jockey pump is also to be provided.
2. The duration of firefighting may be decided from 30 minutes to 120 minutes based on the hazard, fire preparedness, local conditions, to name a few.
3. The required quantity of water may be calculated as per the respective Indian Standards (where available); or based on the Table 8K and Table 8M.

Table 8M

Base Calculations for Hose Stream Protection System

Sl No	Hose Stream Only	Hazard Classification	Hose Stream Flow	No. of Hose Streams	Pump Capacity and Quantity	Duration (min)
i	Level of Protection – HL-1	Extra Light -1	50	4	379 lpm x 1	30–60
ii	Level of Protection – HL-2	Extra Light -2	170	4	946 lpm x 1	30–60
iii	Level of Protection – HL-3	Low Hazard	270	4	1,514 lpm x 1	30–60
iv	Level of Protection – HL-4	Moderate -1	475	4	2,839 lpm x 1	60–120
v	Level of Protection – HL-5	Moderate -2	670	5	4,731 lpm x 1	60–120
vi	Level of Protection – HL-6	Extra Hazard	670	6	5,677 lpm x 1	60–120

Pump capacity = Total flow with 40 percent overflow and operating at 140 percent capacity. For example, for HL-3, capacity will be 270 × 4 = 1 080 litre; together with overflow margin works to 1 512 litre; and pump selection will be 1 512/140 × 100 = 1 514 lpm (nearest Indian Standard pump).

NOTES

1. 'Pump' implies, providing an Electric pump and 'Standby pump of equivalent capacity'. For loss in pressure, jockey pump is also to be provided.
2. The duration of firefighting may be decided from 30 minutes to 120 minutes based on the hazard, fire preparedness, local conditions, to name a few.
3. The required quantity of water may be calculated as per the respective Indian Standards (where available); or based on the Table 8K and Table 8M.

3.10. Fire Drills and Fire Orders

Fire notices/orders should be prepared to fulfil the requirements of firefighting and evacuation from the buildings in the event of fire and other emergency. The occupants should be made thoroughly conversant with their action in the event of emergency, by displaying fire notices at vantage points and also through regular training. Such notices should be displayed prominently in bold lettering. The State/Local body may also decide on the nature and frequency of fire drills to be carried out in buildings.

4. FIRE PROTECTION

4.1. Fire Extinguishers/Fixed Firefighting Installations

4.1.1. All buildings depending upon the occupancy use and height should be protected by fire extinguishers, hose reels, wet riser, down-comer, yard hydrants, automatic sprinkler installation, deluge system, high/medium velocity water spray, foam, water mist systems, gaseous or dry powder system, manual/automatic fire alarm system, etc, in accordance with the provisions of various clauses given below, as applicable:

a) These fire extinguishing equipment and their installation should be in accordance with accepted standards [F (17)]. The extinguishers should be mounted at a convenient height to enable its quick access and efficient use by all in the event of a fire incidence. The requirements of fire extinguishers/yard hydrant systems/wet riser/down-comer installation, etc, should be as specified in Table 8A to Table 8J. See also Table 8K and Table 8M for guidance, on base calculation for capacity of water storage tanks and fire pumps. The requirements regarding size of mains/risers should be as given in Table 8. The typical arrangements of down-comer and wet riser installations, as also the pumping system are

shown in Fig. 15, Fig. 16 and Fig. 17. The wet riser should be designed for zonal distribu on ensuring that unduly high pressures are not developed in risers and hose-pipes.

b) First-aid firefighting appliances should be provided and installed in accordance with good practice [F (18)]. The firefighting equipment and accessories to be installed in buildings for use in firefighting should also be in accordance with the accepted standard [F (17)] and should be maintained periodically so as to ensure their perfect serviceability at all times.

c) Valves in fixed firefighting installations should have supervisory switch with its signalling to fire alarm panel or to have chain(s), pad lock(s), label, and tamper-proof security tag(s) with serial number to prevent tampering/unauthorized operation. These valves should be kept in their intended 'open' position.

d) In addition to wet riser or down-comer, first-aid hose reels should be installed in buildings (where required under Table 8A to Table 8J) on all the floors, in accordance with accepted standard [F(19)]. The first-aid hose reel should be connected directly to the riser/down-comer main and diameter of the hose reel should not be less than 19 mm.

e) Wet risers should be interconnected at terrace level to form a ring and cut-off should be provided for each connection to enable repair/ maintenance without affecting rest of the system.

f) Pressure at the hydraulically remote hydrant and at the highest hydrant should not be less than 3.5 bar. The pressure at the hydrants should however not exceed 7.0 bar, considering the safety of operators. It may be planned to provide orifice plates for landing valves to control pressure to desired limit especially at lower levels. This could also be achieved through other suitable means of pressure reducing devices such as pressure-controlled hydrant valves.

g) Hydrants for firefighting and hose reels should be located in the lobby in firefighting shaft. Those hydrants planned to be provided near fire exit staircase on the floor should be within 5 m from fire exit door in exit access. Such hydrant cabinet may finish with doors to meet interior finishes with requirement of glass panel to provide visibility to the installations inside and inscribed with the word: 'FIRE HOSE CABINET' of letter size 75 mm in height and 12 mm in width. Such door of the fire hose cabinet need not be fire resistant rated. The location of such cabinets should be shown on floor plan and duly displayed in the landing of the respective fire exit staircase.

4.1.2. Static Water Storage Tanks and Pump House

4.1.2.1. Static water storage tanks

A satisfactory supply of water for the purpose of firefighting should always be available in the form of underground/terrace level static storage tank with capacity specified for each building with arrangements or replenishment.

Water for the hydrant services should be stored in an easily accessible surface/underground lined reservoir or above ground tanks made of steel or concrete or masonry. The effective capacity of the reservoir above the top of the pump casing (flooded suction) for various types of occupancies should be as indicated in Table 8A to Table 8J.

Water for firefighting should be stored in two or more interconnected compartments of equal size to facilitate cleaning and maintenance of the tanks without interrupting the water availability for firefighting.

To prevent stagnation of water in the static water storage tank, the suction tank of the domestic water supply should be fed only through an overflow arrangement from the fire water storage tanks to maintain the level therein at the minimum specified capacity.

Alternatively, domestic and fire water can be stored in two interconnected compartments as mentioned above. The suction inlet(s) for the domestic water pumps should be so located at an elevation that minimum water requirements for firefighting as stated in Table 8A to Table 8J will be always available for fire pumps.

The static storage water supply required for the above-mentioned purpose should entirely be accessible to the fire engines of the local fire service. Sufficient number of manholes should be provided for inspection, repairs, insertion of suction hose, etc. As an alternative to the arrangement of manholes to allow access from the top, suitable arrangement to enable efficient access to the tank by the firemen from the adjoining fire pump room having direct access from the ground level, should be made. The underground fire water storage tank(s) should not be more than 7 m in depth from the level having fire brigade draw-out connection, while the draw-out connection should not be more than 5 m away from the tank wall.

The covering slab and its supporting wall/supporting system should be able to withstand a total vehicular load of 45 tonnes (or higher as applicable) equally divided as a four-point load when the slab forms a part of fire apparatus pathway/driveway.

The static water storage tank should be provided with a fire brigade collecting head with 4 number 63 mm diameter (2 number 63 mm diameter for pump with capacity 1 400 litre/min) instantaneous male inlets arranged in a valve box at a suitable point at street level. The same should be connected to the static tank by a suitable fixed galvanized iron pipe not less than 150 mm in diameter to discharge water into the tank when required at the rate of 2 250 litre/min if tank is in the basement or not approachable for the fire engines.

Each of the static water storage tanks should also be provided with a fire brigade draw out collecting head with 63 mm diameter instantaneous male draw out arranged in a valve box at a suitable point at street level. This draw out should be connected to galvanized iron pipe of 100 mm diameter with foot valve arrangement in the tank.

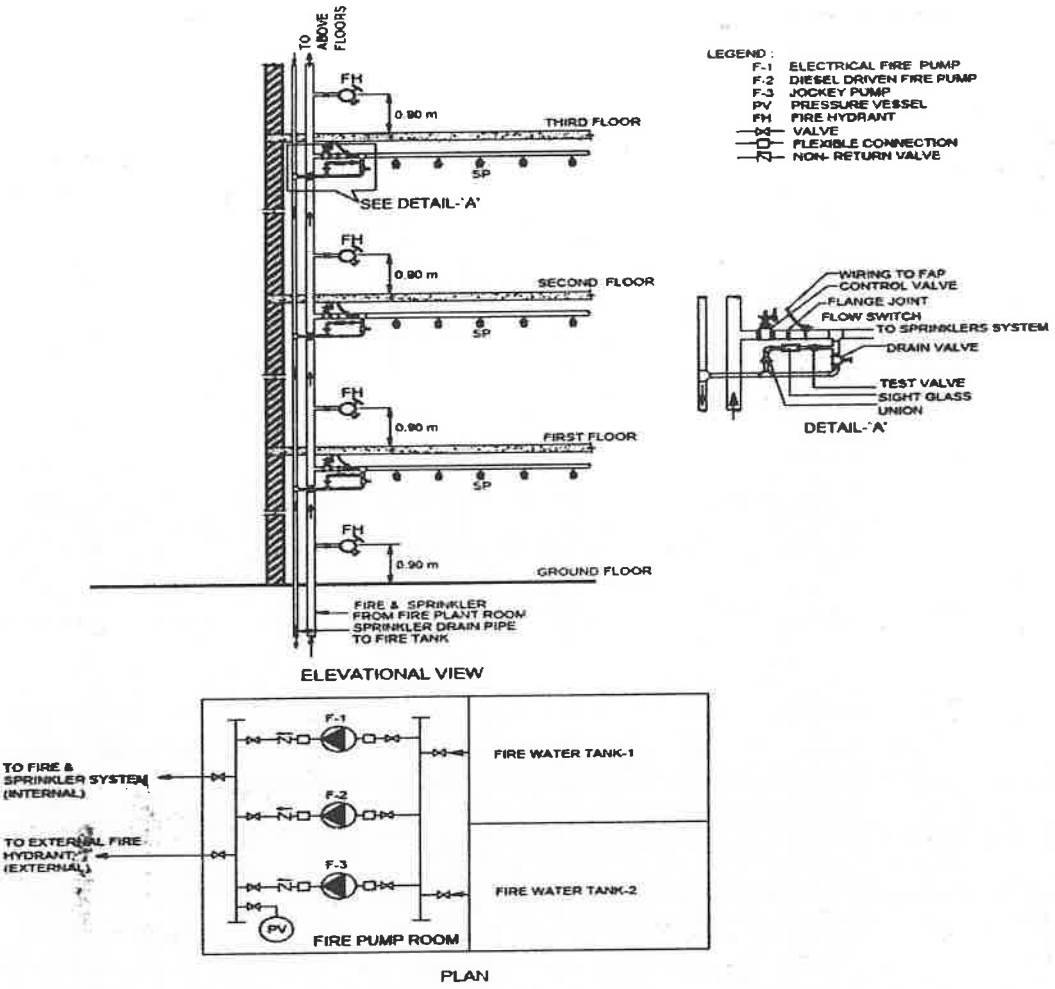


FIG. 15 TYPICAL SYSTEM OF PUMPING WITH ONE ELECTRIC, ONE DIESEL FIRE PUMP

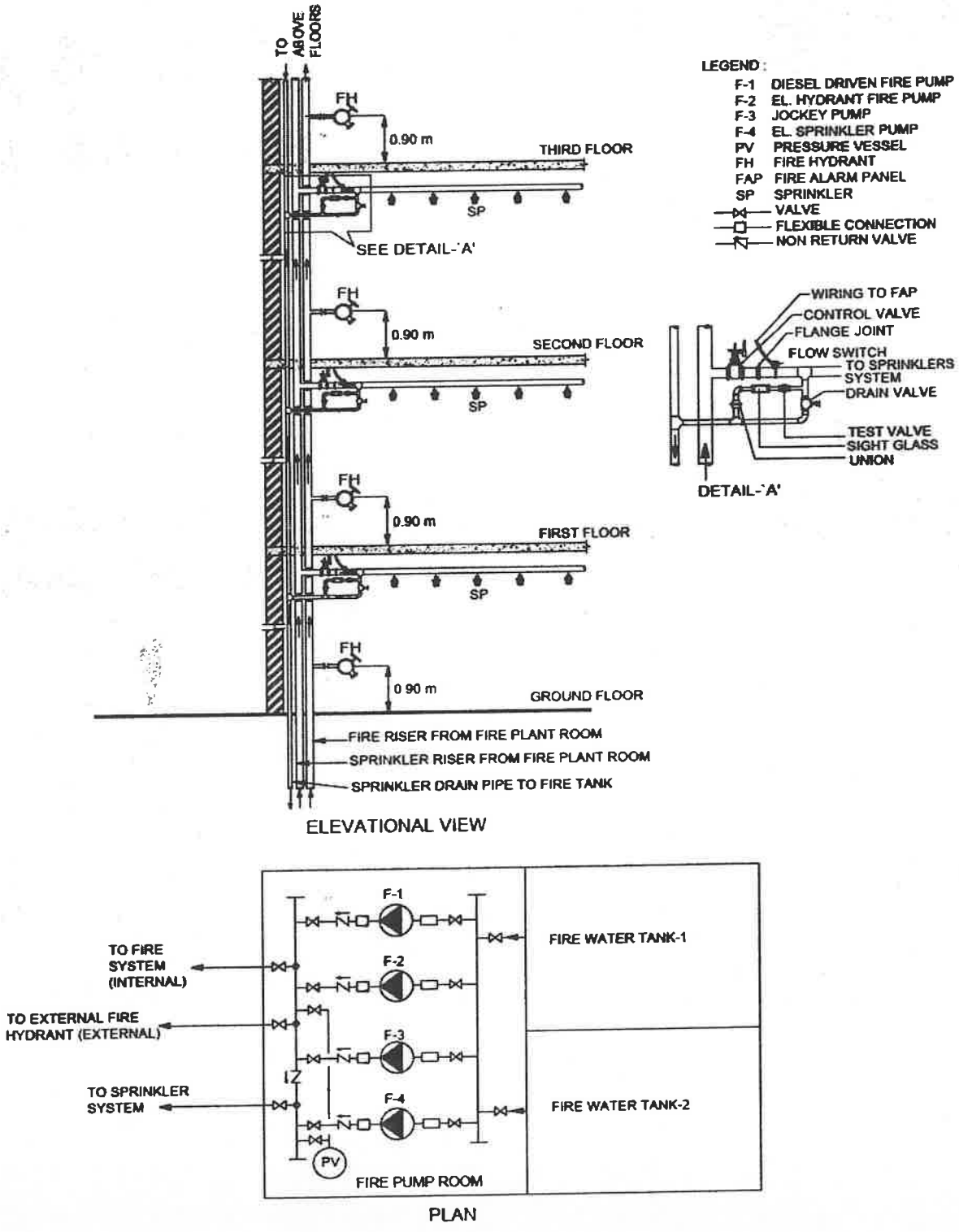


FIG. 16 TYPICAL SYSTEM OF PUMPING WITH TWO ELECTRIC, ONE DIESEL FIRE PUMP

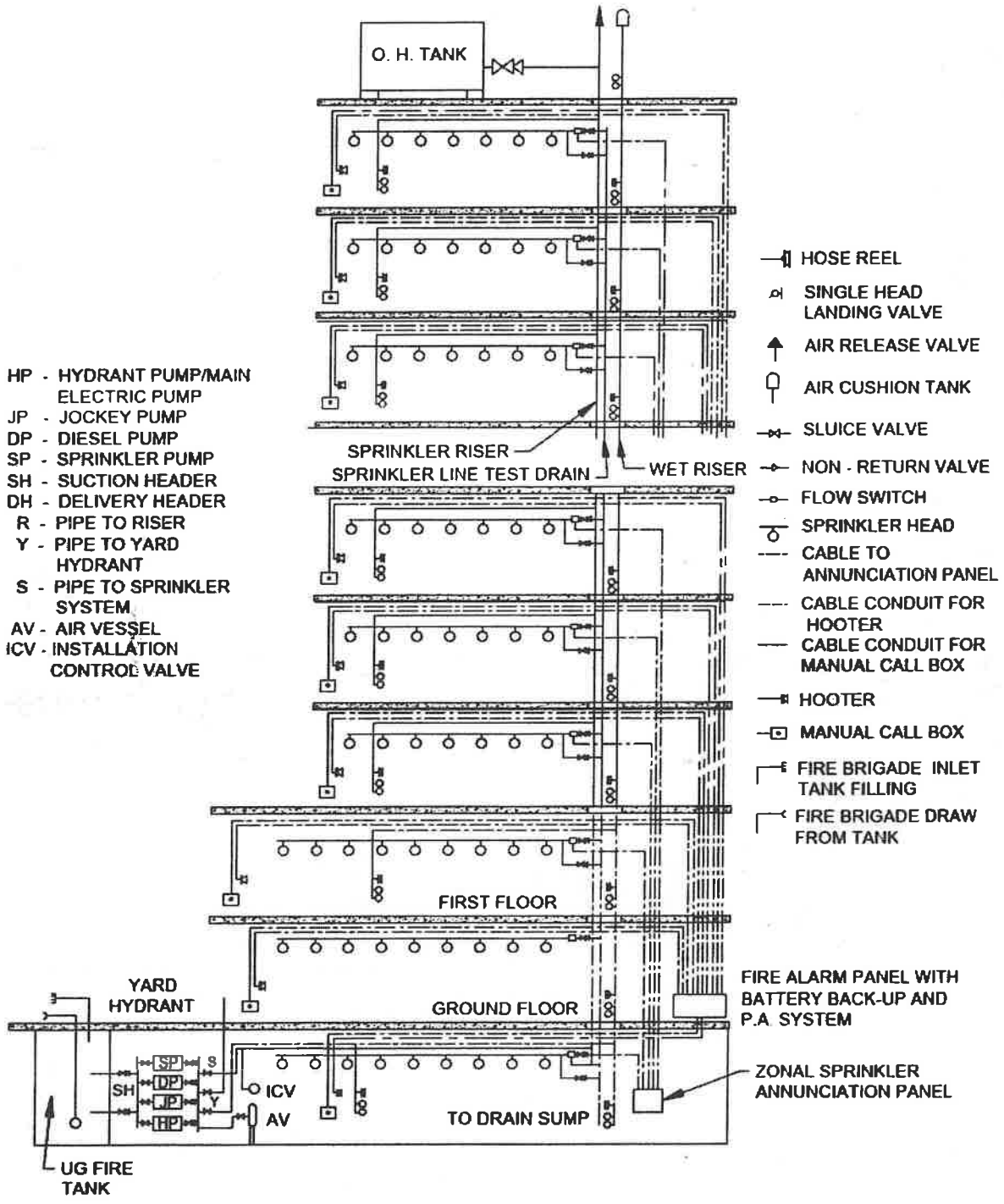


FIG. 17 TYPICAL ARRANGEMENT OF WET RISER AND TOTAL SPRINKLER SYSTEM OF BUILDING

TABLE 8

SIZE OF MAINS

Sl No	Minimum Size of Mains		Building Type	Building Height
			Residential (A)	
		a)	Dormitories	
			Apartments	Up to 15 m
			Hotels	Up to 15 m
i	100 mm with single outlet 63 mm landing valve	b)	Educational (B)	Up to 15 m
		c)	Institutional (C)	Up to 15 m
		d)	Assembly (D)	Up to 15 m
		e)	Business (E)	Up to 15 m
		f)	Mercantile (F)	Up to 9 m
		g)	Industrial (G)	Up to 9 m
ii	150 mm with single outlet 63 mm landing valve	a)	Hotels	Above 15 m
		b)	Starred hotels	-
		c)	Institutional (C)	Above 15 m
		d)	Business (E)	Above 15 m
		e)	Industrial (G)	Up to 15 m
		f)	Storage (H)	Up to 15 m
		g)	Hazardous (J)	Up to 15 m

4.1.2.2. Firefighting pump house

The requirements should be as given below:

a) Pump house should be situated so as to be directly accessible from the surrounding ground level. In the case of industrial occupancies, it is preferable to install the pump house at ground level.

b) When located below ground, the pump house is much preferred in the first basement and should not be installed lower than the second basement (in which case the pumping efficiency should be ascertained). When installed in the basement, staircase with direct accessibility (or through enclosed passageway with 120 minutes fire rating) from the ground, should be provided. Access to the pump room should not require to negotiate through other occupancies within the basement.

c) Pump house need to be separated by fire walls all around and doors to be protected by fire doors (120 minutes rating)

d) Pump house should be well ventilated and due care should be taken to avoid water stagnation.

e) No other utility equipment should be installed inside fire pump room.

f) Insertions like flexible couplings, bellows, etc, in the suction and delivery piping should be suitably planned and installed.

g) Installation of negative suction arrangement and submersible pumps should not be allowed.

h) Pump house should be sufficiently large to accommodate all pumps, and their accessories like pressure reducing valves (PRVs), installation control valves (ICVs), diesel tank and electrical panel. ICV for the towers (superstructure) is allowed to be installed in the first basement, in a duly protected room of 120 minutes fire resistance rating.

i) Battery of diesel engine operated fire pump should have separate charger from emerg cy . power supply circuit.

j) Exhaust pipe of diesel engine should be insulated as per best engineering practice and taken to a safe location at ground level, considering the back pressure.

k) Fire pump is to be provided with soft starter or variable frequency drive starter.

4.1.3. Automatic Sprinkler Installation

The requirements should be as given below:

a) Automatic sprinklers should be installed wherever required in terms of Table 8A to Table 8J throughout the building, for uses as specified in, and in accordance with good practice [F(20)].

b) If selective sprinklering is adopted, there is a real danger of a fire starting in one of the unsprinklered area gathering momentum spreading to other areas and reaching the sprinklered areas as a fully developed fire. In such an event, the sprinklers can be rendered useless or ineffective.

c) Automatic sprinklers should be installed in false ceiling voids exceeding 800 mm in height.

d) Installation of sprinklers may be excluded in any area to be used for substation and DG set.

e) In areas having height 17 m or above such as in atria, sprinkler installations may be rendered ineffective and hence may be avoided.

f) Pressure in sprinkler system should not exceed 12 bar or else high-pressure sprinkler to be installed for above 12 bar operations.

g) The maximum floor area on any one floor to be protected by sprinklers supplied by any one sprinkler system riser from an installation control valve should be based on system protection area limitations considering maximum floor area on any one floor to be 4 500 m2 for all occupancies except industrial and hazardous occupancies, where Authorities should be consulted for advice based on type and nature of risk.

h) Sprinkler installation control valves should be installed inside the fire pump room.

i) For industrial buildings, such installation control valves may be installed outside the building, and Authorities should be consulted in situations where it is not possible to locate them inside the buildings. It is advisable to provide electrically operated siren for each valve outside the buildings in addition to water gongs in such case.

j) The sprinkler flow switches provided should be monitored by fire alarm panel.

k) It is essential to make provisions for avoiding water from sprinkler/hydrant operation entering lifts and electrical rooms.

l) Ramps at all levels should be protected with sprinklers.

m) The water-based sprinkler systems are not suited for specific buildings for example, areas manufacturing electronic equipment, in which case alternate type of protection should only be provided.

n) Colour of the sprinkler piping may be matched to suit the interiors; however, in such case, the piping should be provided with red colour band of about 100 mm wide, every 3 m along the length of the pipe. In no case, the sprinkler heads should be painted.

o) Based on interior design or interior requirements where it is necessary to provide pendent sprinkler with no false ceiling, to achieve the sprinkler response/activation, it is required to provide about 250 mm diameter circular plate around the sprinkler.

CLASSIFICATION OF BUILDINGS FOR APPOINMENT OF FIRE SAFETY SUPERVISOR

(See Section 16 and Rule 15)

Fire Safety Supervisors shall be appointed for different class of buildings as listed below:-

Class of Buildings	Buildings	Fire Safety Supervisor
I	1. Residential Buildings of 45 meters and above in height; 2. Hotels, Resorts, Guest Houses, Dharamshala etc. with 50 rooms or more; Hotels, Resorts, Guest Houses, etc. with 4 Star and above category; 3. Multi-storied non-residential buildings of 24 meters and above in height; 4. Educational Buildings of 15 meters and above in height; 5. Hospital and nursing homes with more than 100/150 beds; 6. All assembly buildings of 15 meters and above in height; 7. Underground shopping complexes, including the basement with total buildup area of more than 1000 Sqm; 8. Cinema Houses/Halls with seating capacity of more than 250 persons; 9. All Cinema Houses/Halls with commercial complex having covered area more than 1000 Sqm; 10. Open stadia with seating capacity of more than 10,000 persons and indoor stadia with seating capacity of more than 2,000 persons; 11. Public, semi-public, private etc. buildings like large surface and sub-surface railway stations, metro stations or mass rapid transit stations, Inter-state bus terminals, amusement parks and other similar buildings. 12. Mercantile/Business Buildings of 24 meters and above in height; 13. Low Hazard industries of total covered area above 10000 Sqm, Moderate Hazard industries of total covered area above 5000 Sqm, High Hazard industries of total covered area above 1000 Sqm; 14. Storage occupancy buildings of total covered area of 10,000 Sqm and above. 15. Hazardous buildings having total covered area of 2500 Sqm or more; 16. Large Oil and Natural Gas Installations such as refineries, LPG bottling plants and other similar facilities;	**Fire Safety Supervisor with sizeable supporting staff**

EXPLANATORY NOTE

In any Part/Section of this schedule, where reference is made to 'good practice' in relation to design, constructional procedures or other related information, and where reference is made to 'accepted standard' in relation to material specification, testing, or other related information, the Indian Standards listed at the end of the Part/Section shall be used as a guide to the interpretation.

At the time of publication, the editions indicated in the standards were valid. All standards are subject to revision and parties to agreements based on any Part/Section are encouraged to investigate the possibility of applying the most recent editions of the standards.

In the list of standards given at the end of a Part/Section, the number appearing within parentheses in the first column indicates the number of the reference of the standard in the Part/Section. For example:

a) Good practices [F(4)] refers to the Indian Standards give at serial number (4) of the list of standards given at the end of this Part F, that is, IS 8758 : 2013 'Recommendations for fire precautionary measures in the construction of temporary structures and pandals (second revision); and Accepted standards [F(1)] refers to the Indian Standards given at serial number (1) of the list of standards given at the end of this Part F, that is, IS 3808 : 1979 'Method of test for non-combustibility of building materials (first revision)'.

LIST OF STANDARDS

The following list records those standards which are acceptable as 'good practice' and 'accepted standards' in the fulfilment of the requirements of this Schedule. The latest version of a standard should be adopted at the time of enforcement of this Schedule. The standards listed may be used by the Authority for conformance with the requirements of the referred clauses in this Schedule.

In the following list, the number appearing in the first column within parentheses indicates the number of the reference in this Schedule.

Ref.	IS No.	Title
(1)	IS 3808: 1979	Method of test for non-combustibility of building materials (first revision)
(2)	IS/ISO 834-1: 1999	Fire resistance tests — Elements of building construction: Part 1 General requirements
	IS/ISO 834-4: 2000	Fire Resistance tests — Elements of building construction: Part 4 Specific requirements for load bearing vertical separating elements
	IS/ISO 834-5: 2000	Fire resistance tests — Elements of building construction: Part 5 Specific requirements for load bearing horizontal separating elements
	IS/ISO 834-7: 2000	Fire-resistance tests — Elements of building construction: Part 7 Specific requirements for columns
	IS/ISO 834-8: 2003	Fire-Resistance tests — Elements of building construction: Part 8 Specific requirements for non-load bearing vertical separating elements
	IS/ISO 834-9: 2003	Fire-resistance tests — Elements of building construction: Part 9 Specific requirements for non-load bearing ceiling elements
(3)	IS 8757: 2021	Glossary of terms associated with fire safety (second revision)
	IS 7673: 2004	Glossary of terms for firefighting equipment (first revision)
(4)	IS 8758: 2013	Recommendations for fire precautionary measures in the construction of temporary structures and pandals (second revision)
(5)	IS 9668: 1990	Code of practice for provision and maintenance of water supplies and fire fighting
	IS 3844: 1989	Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises (first revision)

(6)	IS 1646: 2015	Fire safety of buildings (General): Electrical installations — Code of practice (third revision)
(7)	IS 9457: 2025	Safety colours, safety signs and accident prevention tags — Code of practice (second revision)
	IS 12349: 1988	Fire protection — Safety sign
	IS 12407: 1988	Graphic symbols for fire protection plan
(8)	IS/ISO 7240-7: 2023	Fire detection and alarm systems Part 7: Point-type smoke detectors using scattered light, transmitted light, or Ionization (first revision)
	IS/ISO 7240-12: 2022	Fire detection and alarm systems Part 12 Line type smoke detectors using transmitted optical beam (first revision)
(9)	IS 655: 2006	Specification for air ducts (third revision)
(10)	IS 1649: 1962	Code of practice for design and construction of flues and chimneys for domestic heating appliances (first revision)
	IS 1642: 2013	Code of practice for safety of buildings (general): Details of construction (second revision)
(11)	IS 12777: 1989	Fire safety — Flame spread of products — Method for classification
(12)	IS 1642: 2013	Code of practice for safety of buildings (general): Details of construction (second revision)
(13)	IS 16246: 2015	Elastomer insulated cables with limited circuit integrity when affected by fire — Specification
(14)	IS 6044 (Part 1): 2018	Liquefied petroleum gas storage installations — Code of practice Part 1 Residential commercial and industrial cylinder installations (third revision)
	IS 6044 (Part 2): 2021	Code of practice for liquefied petroleum gas storage installations Part 2 Commercial, industrial and domestic bulk storage installations (second revision)
(15)	IS 2175: 1988	Specification for heat sensitive fire detectors for use in automatic fire alarm system (second revision)
	IS/ISO 7240-5: 2018	Fire detection and alarm systems Part 5 Point-type heat detectors (second revision)
	IS/ISO 7240-7: 2023	Fire detection and alarm systems Part 7 Point-type smoke detectors using scattered light, transmitted light, or ionization (first revision)
	IS/ISO 7240-11: 2011	Fire detection and alarm systems Part 11 Manual call points
	IS/ISO 7240-15: 2014	Fire detection and alarm systems Part 15 Point-type fire detectors combined sensors (first revision)
	IS/ISO 7240-12: 2022	Fire detection and alarm systems Part 12 Line type smoke detectors using transmitted optical beam (first revision)
(16)	IS 2189: 2026	Selection, installation and maintenance of automatic fire detection and alarm system — Code of practice (third revision)
(17)	IS 636: 2018	Non-percolating flexible firefighting delivery hose (fourth revision)
	IS 884: 2025	First-aid hose-reel for firefighting — Specification (second revision)
	IS 901: 1988	Specification for couplings, double male, and double female instantaneous pattern for firefighting (third revision)
	IS 902: 1992	Specification for suction hose couplings for firefighting purposes (third revision)
	IS 903: 2025	Fire hose delivery couplings, branch pipe, nozzles and nozzle spanner — Specification (fifth revision)
	IS 904: 1983	Specification for two-way and three-way suction collecting heads for firefighting purposes (second revision)
	IS 905: 1980	Specification for delivery breechings, dividing and collecting, instantaneous pattern for firefighting purposes (second revision)
	IS 906: 2024	Specification for revolving branch pipe for firefighting (fourth revision)
	IS 907: 1984	Specification for suction strainers, cylindrical type for firefighting purpose (second revision)
	IS 908: 1975	Specification for fire hydrant, stand post type (second revision)
	IS 909: 1992	Specification for underground fire hydrant: Sluice valve type (third revision)

	IS 910: 1980	Specification for combined key for hydrant, hydrant cover and lower va (second revision)
	IS 926: 1985	Specification for fireman's axe (second revision)
	IS 927: 1981	Specification for fire hooks (second revision)
	IS 928: 1984	Specification for fire bells (second revision)
	IS 937: 1981	Specification for washers for water fittings for firefighting purposes (second revision)
	IS 939: 1977	Specification for snatch block for use with fibre rope for fire brigade use (first revision)
	IS 941: 1985	Specification for blowers and exhauster for firefighting (second revision)
	IS 942: 1982	Functional requirements for 275-l/min portable pump set for firefighting (second revision)
	IS 943: 1979	Functional requirement for 680-l/min trailer pump for fire brigade use (second revision)
	IS 944: 1979	Functional requirement for 1800-l/min trailer pump for fire brigade use (second revision)
	IS 947: 1985	Functional requirement for towing tender for trailer fire pump for fire brigade use (first revision)
	IS 948: 1983	Functional requirement for water tender, Type A, for fire brigade use (second revision)
	IS 949: 2012	Functional requirement for emergency (rescue) tender for fire brigade use (second revision)
	IS 950: 2012	Functional requirements for water tender, Type B for fire brigade use (third revision)
	IS 952: 1986	Specification for fog nozzle for fire brigade use (second revision)
	IS 955: 1980	Functional requirements for dry power tender for fire-brigade use (150 kg capacity) (first revision)
	IS 957: 1967	Specification for control van for fire brigade
	IS 1941 (Part 1): 1976	Functional requirements for electric motor sirens: Part 1 AC, 3-phase 50 Hz, 415 Volts type (second revision)
	IS 2097: 2024	Specification for foam making branch pipe (third revision)
	IS 2175: 1988	Specification for heat sensitive fire detectors for use in automatic detectors for use in automatic fire alarm system (second revision)
	IS 2546: 1974	Specification for galvanized mild steel fire bucket (first revision)
	IS 2696: 1974	Functional requirements for 1125 l/min light fire engine (first revision)
	IS 2745: 1983	Specification for non-metal helmet for firemen and civil defence personnel (second revision)
	IS 2871: 2012	Specification for branch pipe, universal for firefighting purposes (second revision)
	IS 2930: 1980	Functional requirements for hose laying tender for fire brigade use (first revision)
	IS 3582: 1984	Specification for basket strainers for firefighting purposes (cylindrical type) (first revision)
	IS 4308: 2019	Specification for dry powder for firefighting (third revision)
	IS 4571: 1977	Specification for aluminium extension ladders for fire brigade use (first revision)
	IS 4643: 1984	Specification for suction wrenches for fire brigade use (first revision)
	IS 4927: 1992	Specification for unlined flax canvas hose for firefighting (first revision)
	IS 4928: 1986	Specification for delivery valve for centrifugal pump outlets (first revision)
	IS 4947: 2006	Specification for gas cartridges for use in fire extinguishers (third revision)
	IS 4989: 2018	Foam concentrates for producing mechanical foam for firefighting — Specification (fourth revision)
	IS 4989 (Part 4): 2003	Multipurpose aqueous film forming foam liquid concentrate for extinguishing hydrocarbon and solvent fires

	IS 5131: 2002	Specification for dividing breeching with control, for fire brigade use (second revision)
	IS 5290: 2025	Specification for landing valve (fourth revision)
	IS 5486: 1985	Specification for quick release knife (first revision)
	IS 5505: 1985	Specification for multi-edged rescue axe (non-wedging) (first revision)
	IS 5612	Specification for hose-clamps and hose-bandages for fire brigade use
	(Part 1): 1977	Hose clamps (first revision)
	(Part 2): 1977	Hose bandages (first revision)
	IS 5714: 1981	Specification for hydrant, stand-pipe for fire fighting (first revision)
	IS 6026: 1985	Specification for hand operated sirens (first revision)
	IS 6067: 1983	Functional requirements for water tender, Type `X' for fire brigade use (first revision)
	IS/ISO 7240-5: 2018	Fire detection and alarm systems: Part 5 Point-type heat detectors (second revision)
	IS/ISO 7240-7: 2023	Fire detection and alarm systems: Part 7 Point-type smoke detectors using scattered light, transmitted light, or ionization (first revision)
	IS/ISO 7240-11: 2011	Fire detection and alarm systems Part 11 Manual call points
	IS 8090: 1976	Specification for couplings, branch pipe, nozzle, used in hose reel tubing for fire fighting (first revision)
	IS 8096: 2005	Rubber or plastics coated fabrics for water resistant clothing — Specification (second revision)
	IS 8423: 1994	Specification for controlled percolating hose for fire fighting (first revision)
	IS 8442: 2024	Specification for stand post type water monitor for fire fighting (second revision)
	IS 9972: 2023	Specification for automatic sprinkler heads (second revision)
	IS 10460: 1983	Functional requirements for small foam tender for fire brigade use
	IS 10993: 1984	Functional requirements for 2 000 kg dry powder tender for fire brigade use
	IS 11101: 1984	Specification for extended branch pipe for fire brigade use
	IS 11108: 1984	Specification for portable fire extinguisher halon —1211 type
	IS 11833: 1986	Specification for dry powder fire extinguisher for metal fires
	IS 12717: 1989	Functional requirements of firefighting equipment — High capacity portable pumpset (1 100-1 600 L/min)
	IS 12796: 1989	Specification for fire rake
	IS 13039: 2014	Code of practice for provision and maintenance of external hydrant system (first revision)
	IS 14933: 2001	Specification for high pressure fire fighting hose
	IS 14951: 2001	Specification for fire extinguisher, 135 l capacity mechanical foam type
	IS 15051: 2001	Specification for high pressure fire hose delivery couplings
	IS 15105: 2021	Design and installation of fixed automatic sprinkler fire extinguishing system (first revision)
	IS 15220: 2002 / ISO 7201-1	Specification for halon 1211 and halon 1301 — Fire extinguishing media for fire protection
	IS 15683: 2018	Portable fire extinguishers — Performance and construction — Specification (first revision)
	IS 15493: 2021	Gaseous fire extinguishing systems — General requirements (first revision)
	IS 15505: 2004 / ISO 14520-6	Gaseous fire extinguishing systems: HCFC Blend A extinguishing systems
	IS 15506: 2004 / ISO 14520-14	Gaseous fire extinguishing systems — IG 55 extinguishing systems
	IS 15525: 2004 / ISO 14520-13	Gaseous fire extinguishing systems — IG 100 extinguishing systems

	IS 15501: 2004 / ISO 14520-15	Gaseous fire extinguishing systems — IG 541 extinguishing systems
	IS 15497: 2004 / ISO 14520-12	Gaseous fire extinguishing systems — IG 01 extinguishing systems
	IS 15519: 2020	Code of practice for water mist fire protection systems — System design, installation, and commissioning (first revision)
	IS 15528: 2004	Gaseous fire extinguishing systems — Carbon dioxide, total flooding and local application including in cabinet subfloors systems
	IS 15517: 2004 / ISO 14520-9	Gaseous fire extinguishing systems — HFC 227ea (Hepta Fluoro Propane) extinguishing system
	IS 16018: 2012	Wheeled fire extinguisher — Performance and construction — Specification
(18)	IS 2190: 2024	Code of practice for selection, installation, and maintenance of portable first-aid fire (fifth revision)
(19)	IS 884: 2025	Specification for first aid hose reel for fire fighting (second revision)
(20)	IS 15105: 2021	Design and installation of fixed automatic sprinkler fire extinguishing system — Code of practice (first revision)
(21)	IS 15325: 2020	Design and installation of fixed automatic high and medium velocity water spray system — Code of practice (first revision)
(22)	IS 12835 (Part 1): 2021	Design and installation of fixed foam fire extinguishing system — Code of practice Part 1 Low expansion foam (first revision)
(23)	IS 15517: 2004	Gaseous fire extinguishing systems — Carbon dioxide, total flooding and local application including in cabinet subfloors systems
(24)	IS 15519: 2020	Water mist fire protection systems — System design, installation, and commissioning — Code of Practice (first revision)
(25)	IS 15493: 2021	Gaseous fire extinguishing systems — General requirements
	IS 15505: 2004	Gaseous fire extinguishing systems — HCFC blend A
	IS 15506: 2004	Gaseous fire extinguishing systems — IG 55 extinguishing systems
	IS 15525: 2004	Gaseous fire extinguishing systems — IG 100 extinguishing systems
	IS 15501: 2004	Gaseous fire extinguishing systems — IG 541 extinguishing systems
	IS 15497: 2004	Gaseous fire extinguishing systems — IG 01 extinguishing systems
	IS 15517: 2004	Gaseous fire extinguishing systems — Carbon dioxide, total flooding and local application including in cabinet subfloors systems
	IS 9668: 1990	Code of practice for provision and maintenance of water supplies and fire fighting
	IS 3844: 1989 IS 3594: 2024	Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises (first revision)
(26)	IS 2189: 2026	Selection, installation and maintenance of automatic fire detection and alarm system — Code of practice (second revision)
	IS 2190: 2024	Selection, installation, and maintenance of portable first-aid fire extinguishers — Code of practice (fifth revision)
	IS 13039: 2014	External hydrant systems — Provision and maintenance — Code of practice (first revision)
(27)	IS 4878: 1986	Byelaws for construction of cinema buildings (first revision)
(28)	IS 2726: 1988	Code of practice for fire safety of industrial buildings: Cotton ginning and pressing (including cotton seed delintering) factories (first revision)
	IS 3034: 1993	Code of practice for fire safety of industrial buildings: Electrical generating and distributing stations (second revision)
	IS 3058: 1990	Code of practice for fire safety of industrial buildings: Viscose rayon yarn and/or staple fibre plants (first revision)
	IS 3079: 1990	Code of practice for fire safety of industrial buildings: Cotton textile mills (first revision)
	IS 3594: 2024	Code of practice for fire safety of industrial buildings: General storage and warehousing including cold storage (second revision)

	IS 3595: 2002	Code of practice for fire safety of industrial buildings: Coal pulverizers and associated equipment (second revision)
	IS 3836: 2000	Code of practice for fire safety of industrial buildings: Jute mills (second revision)
	IS 4209: 2013	Code of safety in chemical laboratories (second revision)
	IS 4226: 1988	Code of practice for fire safety of industrial buildings: Aluminium/ Magnesium powder factories (first revision)
	IS 4886: 1991	Code of practice for fire safety of industrial buildings: Tea factories (first revision)
	IS 6329: 2000	Code of practice for fire safety of industrial buildings: Saw mills and wood works (first revision)
	IS 9109: 2000	Code of practice for fire safety of industrial buildings: Paint and varnish factories
	IS 11457 (Part 1): 1985	Code of practice for fire safety of chemical industries: Part 1 Rubber and plastic
(29)	IS 13039: 2014	External hydrant systems — Provision and maintenance — Code of practice (first revision)
(30)	IS 18271: 2023	Fire safety in commercial kitchen — Guidelines
(31)	IS 4963: 2025	Accessibility in built environment for older adults and persons with disabilities — Requirements (second revision)
(32)	IS 16700: 2023	Criteria for structural safety of tall concrete buildings (first revision)
(33)	IS 3614: 2021	Fire doors and door sets — Specification (first revision)
(34)	IS 12458: 2019	Fire resistance of through penetration firestops — Method of test (first revision)
(35)	IS 18190: 2023	Fire resistance of perimeter fire barrier joint system — Method of tests

By order and in the name of the Governor of Madhya Pradesh,
B.S. JAMOD, Secy.

नियंत्रक, शासकीय मुद्रण तथा लेखन सामग्री, मध्यप्रदेश द्वारा शासकीय केन्द्रीय मुद्रणालय, भोपाल से मुद्रित तथा प्रकाशित--2026.