

E1-E2: ELECTRICAL

CHAPTER-16

SALIENT FEATURES OF FIRE PROTECTION

MANUAL

Salient Features Of Fire Protection Manual

General Guidelines

1.1 Scope

Fire protection covers the following aspects :

- (i) Fire prevention and precautions
- (ii) Fire detection and alarm
- (iii) Safe exit of occupants in the event of fire
- (iv) Fire extinguishing apparatus

1.2 Objectives

There is no substitute for the determined and disciplined actions and attitudes in relation to design of buildings and selection of materials, good house keeping, general tidiness, control of combustible materials to minimise the fire risks. Once fire breaks out, an efficient fire detection and alarm system should be available so that timely action to control the fire and evacuation of personnel, in case of spread of fire, can be taken. The building design should provide for adequate escape routes for safe and expeditious exit of all the occupants. Fixed and portable fire extinguishing apparatus fully charged with extinguishing agent should be available in sufficient numbers at convenient locations to check fires in the incipient stage. These appliances should be kept in working order and maintenance norms should be strictly enforced. This manual has been framed keeping the above broad objectives, in view.

1.3 Different type of Telecommunication Systems Covered.

All Telecommunication buildings housing Telecommunication Equipments i.e. Telephone Exchanges, Trunk Exchanges, Telegraph Centres, Transmission Centres etc. etc.

Building Planning & Design

2.1 General

2.1.1 National Building Code 1980 (Part IV) deals with the aspect of fire protection of buildings. The provisions made therein shall be generally adopted for design of departmental buildings. The National Building Code gives a general classification of groups of buildings based on their occupancy. Telecom buildings are not specifically classified in any group. As such, the common provisions applicable to all the groups of buildings and specific provisions to “Group E-Business Buildings” should be adopted for Telecom Buildings. It should also be in conformity with IS : 1642-1989.

2.1.2 Some local bodies e.g. Bombay Municipal Corporation and Delhi Municipal Corporation have enacted Fire Bye-laws. Such Bye-laws have a statutory force and must be followed in case of all buildings in their respective jurisdictions.

2.1.3 For purposes of these regulations all buildings above 15 Metres in height are categorized as high rise buildings.

2.2 Materials of Construction

2.2.1 Door and Shutters –Only metallic doors shall be used in electrical sub-stations. For electrical DBs metallic shutters and frame shall be used.

2.2.2 Limitations in the use of synthetic products and materials – In the interior fittings of all technical buildings, use of synthetic materials and products such as plastic materials, synthetic fibres, textiles etc. whose composition contains nitrogen or chlorine likely to be discharged in the form of hydrodynamic or hydrochloric acid fumes shall be avoided as far as possible. Internal fittings the deemed to include coverings of walls, partitions, ceilings, decorations, tapestary, curtains, conduits or pipe work non-incorporated or non-embedded fixed furniture etc.

2.3 General Requirements

Open Spaces (High Rise Buildings) – Compulsory open spaces around the buildings (of sufficient width to allow free movement of fire fighting vehicles i.e. 4.5 Metres) shall be provided and shall not be used for parking. The minimum radius at the turnings shall not be less than 9 Metres. The width of entry gate shall not be less than 5 Metres (Clear).

2.3.1 Protection of Openings – Openings in walls and floors which are necessary to be provided to allow cables / electrical wiring / Telecom cables / plumbing and fixtures etc. shall be sealed by a filler material of compressed asbestos fibre mixed with cement or vermaculite concrete or any other filler material having a fire resistance of 2 hours. These openings in the floors / walls shall be protected by vertical / horizontal enclosures of at least 300 mm extending beyond these openings.

2.3.2 Ventilation of Basements – The basement shall be ventilated by suitable vents of cross sectional area not less than 2.5 per cent of the floor area spread evenly round the perimeter of the basement. Canteens, fuel storage etc. shall not be permitted in the basement. These should be preferably be in a separate block. Use of corridors for keeping lockers should be avoided and separate rooms shall be provided to keep the corridors free of obstruction to movements. Service ducts shall be

enclosed by walls and doors of 2 hours fire resistance. If the plan area of the ducts exceeds 1 sq. mt. slab shall be provided at each floor to seal the remaining areas after providing the pipes, conduits, A.C. ducts etc.

2.3.3 Lighting of Exits and Stairs

The staircase and corridor lighting shall have separate circuits and shall be independently connected so that it could be operated by one switch on the ground floor, easily accessible to the fire fighting personnel. Staircase and corridor lighting shall be connected to alternative supply. Emergency lights shall be provided in staircases and corridors.

2.4 Lifts and Lift Lobbies

In multi-storied buildings, the following requirements of lifts and lift lobbies shall be met.

2.4.1 Number of lifts in one lift bank shall not exceed four. Individual shafts in a bank shall be separated by a wall of two hours fire rating.

2.4.2 If the lift lobby and lift shaft is in the core of the building, a positive pressure of 2.5 mm of water gauge shall be maintained in the lobby and 5 mm. in the lift shaft. The pressurisation mechanism shall start automatically on the fire alarm. It shall be possible to operate this manually also.

2.4.3 Telephone or other communication facilities shall be provided in the lift cars.

2.4.4 To enable the fire service personnel to reach the upper floor with minimum delay, one or more lifts shall be designated as 'FIRE LIFT' shall be conspicuously displayed on the landing doors at each floor level. A toggle switch shall be provided at the ground floor lobby for 'FIRE LIFTS'. This switch shall be provided at 2 Metres above the floor level and shall be provided with a glass cover. On operation of this switch by fire personnel, the lift car will come to the ground floor straight and there after its operation shall be controlled only from inside the lift car.

2.4.5 Lift shall not normally communicate with the basement. However, one of the lifts may be permitted to reach the basement levels provided the lift lobby at each basement level is pressurised and separated from the rest of the basement area, by smoke actuated fire resisting door of two hours fire resistance.

2.5 Fire Control Room

For all High Rise Buildings there shall be a control room of 4 m x 4m (min) at the ground floor entrance lobby of the building with communication system (suitable public address system) at all floors and facilities for receiving message from different floors. Details of all floor plans along with details of the fighting equipment installation in the building shall be maintained in the fire control room. This room shall also have facilities to detect the fire on any floor through indicator boards connecting the fire detecting and alarm system on all floor. The staff incharge of fire control room shall be responsible for this maintenance of various emergency services, fire fighting equipments and installations.

3. Electrical Installations And Their Upkeep

3.1 Switch Boards

3.1.1 Switch boards shall be erected in a easily accessible and approved positions. Every switch board shall comply with the following provisions :—

- (a) A clear space of not less than one metre width in the front side.
- (b) The space behind the switch boards shall be either less than 200 mm or more than 750 mm from the farthest outstanding part of any attachments or conductor.
- (c) If the space behind the switch board exceeds 750 mm width, there shall be a passage-way from either end of the switch board with a clear height of 1800 mm.

3.1.2 No article shall be stored at the back of the switch boards.

3.1.3 All switches and circuit breakers shall be operated from the front of the switch boards.

3.1.4 All screws, bolts and nuts which secure current carrying parts to the board shall be of brass, copper or equivalent rust proof material.

3.1.5 Joints if any in wires and cables shall be crimped joints.

3.1.6 Wood work shall not be used in the construction of the enclosures of the switch boards except for shutters lined on both sides with fire resisting materials e.g. G.I. sheet.

3.1.7 The neutral of each main or branch main circuit shall be provided with a suitable removable line placed in an easily accessible position for the purpose of testing. The neutrals shall not be bunched in inconvenient and inaccessible positions at the back.

3.1.8 All circuits shall be clearly and indelibly labeled for identification.

3.1.9 All equipment of power distribution boards shall be of iron clad or steel construction throughout and dust tight.

3.1.10 Wiring to and from the switchgear shall be of armoured cables or with conduit/metallic covering. Flexible tubing shall not be allowed excepting for connections to motors and starters, but the length shall be restricted to 1200 mm.

3.1.11 Ends of conduits shall be bushed and glands shall be provided for armoured cables.

3.1.12 All unused cable-holes shall be effectively closed.

3.2 Wiring

3.2.1 All surface wiring shall be in metallic conduits / enclosures.

3.2.2 Joint boxes, inspection bends, drawing-in boxes shall be covered at all times with metal covers.

3.2.3 T-joints in power wiring shall not be permitted.

3.2.4 Temporary wiring or external circuits shall not be ordinarily permitted. Wherever extension circuits are needed those shall be installed only after prior approval of the Officer-in-Charge of the maintenance of Electrical installation.

3.2.5 Telephone or other wiring not pertaining to lighting and power system shall be spaced at least 300 mm from it throughout the installations.

3.2.6 Any 230 Volt wiring for lighting or other services, above the false ceiling shall run in metal conduit/metal trunk box/armoured cable and shall have 660 V grade insulation.

3.3 Power Cabling

3.3.1 Sizing of all power cables, types of cables, laying practice, jointing methods, safety precautions etc., shall be according to the Standard Engineering Practice, specifications of the Electrical Wing and safety provisions of IE Rules.

3.4 Earthing

3.4.1 All earthing leads and earth connections shall be tested for electrical resistance to ensure efficient earthing before electric supply line or apparatus is energized. In

addition, earth resistance shall be tested on a day during dry season not less than once a year and record of resistance measured shall be kept in log book.

3.4.2 Testing – Electrical Installation shall be tested as per CPWD specifications.

3.5 Transformer Sub-station (Indoor Type)

3.5.1 General – Sub-station shall not be permitted in basements.

3.5.2 The supply Company's high tension switchgear and metering equipment shall be placed in a separate enclosures approachable by the supply Company at all times.

3.5.3 Provisions of soak pit & oil draining arrangements shall be provided as per provisions of IE rules.

3.5.4 Clearance between transformer and other apparatus and enclosing or separating walls etc. shall follow the relevant provisions of IE rules.

3.5.5 Cable trenches inside sub-station shall be filled with pebbles or sand or similar non-inflammable materials or completely covered with non-inflammable slabs or steel plates. However provisions as per para 2.5.2 shall apply in all cases.

3.5.6 All control gear shall be protected against rodents, reptiles or insects.

3.5.7 Sub-station buildings shall be used for housing only the intended equipment and not for storage or repair work.

3.6 Essential Circuits

Separate circuits for water pumps. Fire pumps, lifts, staircase and corridor lighting and blowers for pressurization system shall be provided directly from Emergency LT Panel (Supply from main as well as standby source with changeover arrangements). Switches controlling essential services shall be clearly labeled.

3.7 Staircase and Corridor Lights

3.7.1 The staircase and corridor lighting shall be on separate circuits so that it can be operated

by on switch installed at ground floor easily accessible to fire fighting personnel.

3.7.2 Staircase and corridor lighting shall be connected to standby generator supply.

3.7.3 In all cases, emergency lights shall be provided in staircase / corridors.

4. Telecom Equipment And Power Wiring

4.1 Protection / Isolation

4.1.1 Adequate protection/isolation facility should be available in the AC/DC distribution system by provision of fuses/circuit breakers. The Circuit breakers shall have manual tripping facility. No bare wire shall be used in the fuses; only cartridge fuses shall be used.

4.1.2 Suitable arrangement to shut off the rectifier whenever the input voltage goes beyond the specified limit shall be provided in the power plant with alarm indication.

4.1.3 The distribution fuses / circuit breakers shall be rated for maximum load condition and should be easily accessible.

4.1.4 In all Electronic Exchanges an emergency switch shall be provided in switch room, close to the entry to cut off power to the equipment, in case of an emergency.

4.2 Bus Bars

4.2.1 The power distribution shall be as far as possible, by bus bars and they shall run in the free space which is open to easy inspection.

4.2.2 The bus bars shall always be run with the narrow side facing the ground i.e. the longer side shall be vertical.

4.2.3 The positive and negative bus bars shall be colored with a suitable insulated coating / covering of red for positive and blue for negative.

4.2.4. The crossing of distribution cables over the bus bards shall be avoided.

4.2.5 Crossing of light fittings and air-conditioning ducts above bus bards shall be avoided. If unavoidable, the bus bards shall be covered by fire proof material and shall be properly anchored.

4.2.6 In multi-exchange buildings, when a common power plant feeds more than one Exchange, independent bus bar shall be provided for each Exchange.

4.3 Separation of A.C./D.C. Distribution

A.C. input leads and D.C. input leads-shall not travel in the same rack/run-way side by side.

4.4 Terminations of Leads

The leads shall be fixed tightly to the terminals and shall preferably have crimped connections. Nuts and bolts used for connecting the terminals or busbars or fishplates should be proper size and well tightened.

4.5 Earthing

Power plant as well as other equipment shall be properly earthened. The frame earth and battery earth shall be separate and shall maintain a resistance not exceeding 0.5 ohms for all electronic exchange. Bare Stranded conductor without any joint shall be used as earth lead right from the spike or plate earth unto the earth terminal in the power room. In case of multi-exchange buildings, each exchange shall have separate earth.

4.6 Communication Cables

Communication cables shall be laid at a safe distance from the power cables.

4.7 Fire Fighting Instructions – Display

Clear cut instructions regarding operations to be carried out in case of fire shall be displayed prominently all equipment rooms.

Air Conditioning Installations

5.1 Ducting

5.1.1 The material used for insulating the ducts shall be non-combustible. Suitable cladding shall be provided with GI or Aluminum or any such non-combustible material.

5.1.2 Whenever the duct passes through fire walls or floor openings the area around the ducts shall be sealed with fire resisting material e.g. asbestos rope etc.

5.1.3 Inspection panels shall be provided to facilitate access for maintenance of fire dampers.

5.1.4 Ducts shall not pass through staircase enclosures.

5.1.5 Normally air handling units shall be separate for each floor and air ducts for every floor shall be separate.

5.1.6 As far as possible, ducts shall not cross power bus bars in equipment rooms. However, if the crossing is unavoidable, suitable protection shall be provided.

5.2 Return Air

5.2.1 Where plenum is used for return air passage, the false ceiling and its fixtures shall be of non-combustible material.

5.2.2 Escape route like staircase, lift lobbies etc., shall not be used for return air passage. However, unavoidable, the return air boxing shall be fabricated from fire proof material.

5.4 Fire Dampers

5.4.1 All ducts emerging from Weather Maker Units shall be provided with fire dampers.

5.4.2 The fire dampers shall be automatic in operation working on a fusible link and shall be arranged to close by gravity in the direction of air movement.

5.5 Automatic Shut Off on Fire Alarm

In all plants, there shall be a provision for automatic switch off of the respective air handling units / package plant with the operation of the fire alarm. The air handling / plant rooms located adjacent to the equipment rooms shall be separated by a portion of minimum two hours fire resistance. As soon as the blower is stopped, the package plant / AHU / heater element should get switched off automatically.

In addition to the above, thermostat control should be provided to switch off the heaters whenever the air flow stops and the temperature raises beyond a predetermined level. Air filters shall be of non-combustible material.

6.1 Fire Detection And Alarm

6.2 Manual Fire Alarm

6.2.1 Small and Medium capacity exchange not exceeding 2K Lines shall have Manual Fire Alarm System. For the purpose of alarm system, the building shall be divided into a number of zones. In multi storied buildings each floor shall constitute one or more zones depending on area of the floor.

6.2.2 Fire alarm switches/call boxes shall be mounted at convenient locations in the zones. The call boxes shall be accessible to all occupants without having to travel more than 22.5 m. The call boxes shall be so installed that their location is easily noticed from either direction. The base of call boxes shall be at a height of 1.2 mts.

Above floor level. The call boxes shall be coloured RED.

6.3 Automatic Fire Detection System

6.3.1 All types of buildings housing New Technology Exchanges, E-10B Exchanges, C-DOT Max I exchanges and RLU exceeding 2 K exchanges shall be provided with an automatic fire detection system along with suitable no. of call boxes in the corridor area. The zoning shall be as per 6.2.1 above. In case Exchange having false floor plenum and false ceiling (attic spaces), such areas shall be treated as separate zones. **6.3.2** Buildings other than Telephone Exchange Buildings shall be provided with automatic fire detection system as per local fire by-laws. In case there are no fire by-laws, buildings above 15 mtr. In height shall be provided with automatic fire detection system.

6.4 Design and Selection

6.4.1 Detectors which are normally used are broadly covered in two categories viz; Heat and Smoke type. Smoke type is again of two types viz; Photo Electric & Ionisation.

6.4.2 Ionisation or photo electric detector shall be provided in the areas which are normally free from smoke. Heat detectors shall be provided for the areas like kitchen, Battery room etc. which are prone to smoke.

6.4.3 The area to be protected by Ionisation and Photo Electric Detectors shall be generally in accordance with the standards laid down below. Additional detectors if any shall be provided as per user's requirement.

- (a) Each detector shall cover an area not exceeding 25 sq. mtrs. in case of air conditioned equipment rooms.
- (b) Each detector shall cover an area not exceeding 40 sq. mtrs. in case of non-airconditioned technical rooms.
- (c) Each detector shall cover an area not exceeding 50 sq. mtrs. in case of rooms having no equipment.
- (d) Each detector shall cover an area not exceeding 10 sq. mtrs. when provided above false ceiling or below false flooring or over fully covered cable network.
- (e) Area separated by beams having depth of minimum 450 mm shall have separate detector irrespective of area.
- (f) Maximum horizontal distance between center to center of heat detector and smoke detector when provided in corridor shall not exceed 10 mtrs.
- (g) Ionisation or Photo Electric detector shall be installed above the racks at a distance not exceeding 4.0 mtrs. Between detectors in case of Electronic Exchanges.

6.4.4 Ionisation and photo electric type smoke detectors shall be provided in the ratio of 1:1 for monitoring purpose.

6.4.5 Each Heat Detector shall cover an area not exceeding 40 sq.mtrs.

6.4.6 Each return air opening in the weather maker room shall be provided with one Duct Detected. The detector shall be ionization type smoke detector fitted inside the sampler box.

6.4.7 Each room including electrical rising main room shall necessarily be provided with at least one detector irrespective of its area.

6.4.8 Signals from detectors which are normally not visible shall be extended in the shape of Response Indicators to a suitable location which is easily visible.

6.4.9 Local control panels shall be provided at the respective floors at easily accessible areas like corridors etc. where the same can be properly monitored. The main Control Panel shall be installed preferably at the ground floor at the fire control room. Standby batteries for power supply to the panels shall be provided near the panel.

6.4.10 A minimum of two speakers for audible alarm and / or public announcement shall be provided on each floor and at least one speaker shall be provided on terrace.

6.5 The Response Indicator shall be lit by means of twin LEDs in red colour and shall be housed in MS box.

6.5.1 The response indicators for the Detectors below the false floor, shall be installed with top at 300 sq. mtrs. Above false floor at nearby wall/column or directly on false floor by making suitable cutout and covered with thick glass. For Detectors above false ceiling, the Response Indicators shall be installed either right below on the false ceiling or on the nearby wall / column with bottom 300 mm below false ceiling. Alternatives all Response Indicators shall be located at convenient places as approved. The cover plate of the Response Indicators shall also boldly display the Detector number to which they correspond.

6.6 Each detector shall be numbered zonal-wise such as Z09/N-10, wherein Z09 indicates number nine and N-10 indicates detector number 10 in that zone.

6.7 All the cables and wires shall be tagged or labeled with ferrules for proper identification at the Termination end.

6.8 The specification of different types of Detectors selected shall conform to the detailed specification issued by the Department.

6.9 Hooters and Manuals Call Points

6.9.1 Hooters

(a) The hooter shall be suitable for wall mounting and shall incorporate hooter card and sepal inside a metallic box. The hooter shall be mounted at about 2.4 mt. above floor level.

(b) The hooter shall be actuated by the control panel. PA system shall have separate speaker.

6.9.2 Manual Call Point or Pill Box

(a) The manual call point box shall be aluminum or M.S. construction painted with fire reach.

(b) The box shall be provided with front glass (minimum 30 sq.cm.) and gasket to make it complete vermin and dust proof along with hammer and chain. Those shall be so located to ensure that once the other call box shall be readily accessible to all occupants of the floor without having to travel more than 22.5 metres.

(c) The glass front cover shall have a write up :- '**BREAK GLASS IN CASE OF FIRE**'

(d) The box shall be suitable for wall mounting and shall be mounted at 1.2 metre above floor level.

6.10 Control Panels, Power Supply and P.A. System

6.10.1 General Design

(a) All indicating lamps, control switches, buttons and fuses shall be located in the front of the panels. These shall be suitably and unambiguously labeled.

(b) The indicating lamps shall be LED type of the following colours. The fire conditions as shall be indicated by twin lamps.

(1) Red to indicated FIRE conditions

(2) Amber to indicate FAULT condition.

(3) Green to indicate HEALTHY condition.

(c) Test buttons to test the indicating lamps shall be provided.

6.10 Mimic Diagram

A mimic diagram with clear indication of location of all the zones and the topographical representation of the premises shall be provided near the main control panel. Floor wise

mimic panels shall also be provided. The construction of the mimic diagram shall be in a metal framework suitable for wall mounting with facia of acrylic sheet with lighted and labeled (or engraved) indications.

7. Fire Fighting Appliances

7.1 Fixed Fire Fighting Installations

7.1.1 All high rise buildings shall be provided with a wet riser system as per local fire bye laws. In case there are no fire bye laws, all buildings above 15m. in height shall be protected by a wet riser system. A wet riser is an arrangement for fire fighting within the building by means of vertical rising mains not less than 100 mm internal dia with hydrant outlets and hose reels on each floor/landing connected to a water tank with a fire pump and to an over-head-head tank. The size and No. of internal vertical rising mains depends upon the height of building and floor area. A Fire Brigade inlet at ground level fitted with a non-return valve is also provided for charging the rising main with a Fire Brigade pump in case of failure of fire pump. Fire Brigade inlet connection is also provided for the under ground static water storage tank.

7.2 Automatic Sprinklers

Automatic high pressure water spray or foam Sprinklers shall be installed in basements and sub-basements which are used for car parks, sub stations, engine alternators and storage of explosives and hazardous materials in a building 15 m and above or according to provisions of local fire bye laws. All building exceedings 45 mtrs (unless otherwise specified in local fire bye laws) shall be provided with Automatic Sprinklers on all the floors.

7.3 Portable Fire Extinguishers

7.3.1 Fire extinguishers shall be provided at conspicuous locations in the buildings. The extinguishers shall be hung on brackets or kept in shelves and shall have their bottoms 1000 mm above the floor level. Some of the extinguishers shall be mounted on wheels to facilitate movement. Extinguishers shall not be kept too close to the equipment.

7.3.2 The minimum number of extinguishers to be provided shall be as under :

(a) For Administrative buildings : - For every 300 Sq.mt. of floor area 1 No. 4.5 Kg. CO2 type extinguishers

(b) For Technical buildings :- 1 No. 4.5 kgs. CO2 type extinguisher for every 100 Sq. Mt.of floor area. Out of above one can be trolly type.

Location of units to be decided keeping.

(a) A person does not have to travel more than 15 mtrs. To reach nearest extinguisher.

(b) In Technical rooms depending upon importance / fire hazards.

(iii) Sub-stations, Transformer HT/LT switchgear rooms :- Two Nos. 4.5 Kg. CO2 type extinguishers in each room or cubicle.

7.3.3 The operating instructions shall be clearly printed on the body of the extinguisher. The intended use of the extinguisher i.e. the type of fire for which suitable shall be marked on it.

7.3.4 Sufficient quantity of refills for the extinguishers shall be stored (wherever applicable).

7.3.5 Two water and two sand buckets shall also be installed outside the equipment rooms and in life lobbies/staircase lobbies of the building at each floor. Only sand buckets (2 nos.) shall be provided in sub-station & other areas with electrical equipments. Extinguishers with ISI markings only shall be provided. The refills shall also be of ISI marking.

7.4 Medical Equipment, first aid Box

7.4.1 In all buildings following medical equipments shall be provided :

Gas Mask Respirators – 2 Nos. on each floor locations.

Resuscitators – 2 Nos. on each floor.

Breathing Apparatus — 2 Nos. in each multi-storied building (in fire control room).

The above medical equipment shall be placed in glass front metal cabinets at conspicuous locations. In addition, first aid box shall also be provided at conspicuous location at each floor & in Fire Control Room.

Maintenance Of Fire Fighting Appliances

The fire fighting equipment shall be kept in good working order at all times and maintenance the schedule of the system should be drawn up by the maintenance unit and circulated to all the concerned for proper monitoring and execution. Fire safety officer shall be responsible for proper monitoring of the fire detection and fire fighting system and its general cleanliness.

A log book to record inspection notes, details of replacements, modifications, abnormal behavior observed, corrective measures taken etc. should be maintained. Some important points as under should be test checked during inspection to be carried out by the Fire Safety Officer :-

10.1 Fire alarm and detection system (Once is a month)

(i) Functional tests on / from control panel(s).

(ii) Working of the manual fire alarm points.

(iii) General cleanliness of the system particularly the detector heads.

10.2 Fire Telephone

The non-exchange line fire telephone for communicating with the Fire Brigade shall be checked daily by the respective Floor Wardens.

10.3 Wet Riser System

10.3.1 Hydrant mains shall be tested once a fortnight for its satisfactory operation.

10.4 Hose Pipes and Nozzles

10.4.1 All hose boxes / hose stations shall be inspected externally once a week to ensure that equipment installed therein is intact.

10.4.2 Fire protection hoses shall not be utilized for any other purpose.

10.5 Fire Pumps

10.5.1 A trained person shall be available at all hours of the day and night to operate the pump when required. The services of such a person can also be utilized for other maintenance operations.

10.5.2 Pump Sets shall be run at least five minutes every day.

10.5.3 The level of water in the priming tank shall be checked daily to ensure that the foot valve is not leaking.

10.6 Portable Fire Extinguishers

Routine inspection, maintenance and testing of all fire extinguishers should be carried out by properly trained personnel once a month and the fire safety officer should test check the functioning of the extinguishers for their proper working.

Questions:

- 1) What are the provisions of lighting of Exits, Stairs & Corridors as per the Fire Protection Manual?
- 2) What are the general requirements in high-rise buildings with reference to open spaces?
- 3) What are the general requirements with reference to lifts and lift lobbies?
- 4) What are the general requirements with reference to transformer sub-station (Indoor type)?
- 5) What are the provisions in Fire Protection Manual regarding essential circuits?
- 6) Write short-note on Fire Control Room.
- 7) What are the provisions in Fire Protection Manual regarding fire dampers?
- 8) What are the provisions in Fire Protection Manual regarding automatic shut-off on fire alarm?
- 9) Write short note on Manual Fire Alarm.
- 10) Describe design criteria for air-conditioned equipment rooms for Auto FD & FA system.