

## **CODIFIED REQUIREMENTS**

### **LOW RISE RESIDENTIAL BUILDING ONLY (Up to 32 mtrs)**

#### **1. ACCESS: -**

- a) All access & fire tender access should be free of encumbrances.
- b) Entrance gate (if provided) is not less than 4.50 meters width.
- c) Archways (if provided above entrance gate) height clearance is not less than 4.50 Mtrs.
- d) Access road to the building is as per Regulation No.19 of DCPR-2034.

#### **2. PROTECTION TO STRUCTURAL STEEL: -**

- a. All the structural steel members i.e. columns, beams etc., shall be protected with the 02 hours fire resisting materials and same is to be stipulated as per IS 15103:2002.
- b. A certificate to that effect regarding the fire resistance protection has been provided is obtained from the Chartered Structural Engineer at the time of application for occupying the building.

#### **3. COURTYARDS: -**

- a) The available courtyards and all the sides from building line is paved suitably to bear the load of fire engines weighing up to 28 metric tons each.
- b) All the courtyards is in one plane and same is free from obstruction at all times.
- c) No structure of any type shall be permitted in courtyards of the building.

#### **4. DUPLEX FLATS (If Provided)**

- a) Entrance/Exit doors of the Upper duplex rooms is having Fire rating not less than one hrs. and same shall be also open up in the protected common Lift lobby/corridor passage without any hindrances.
- b) Entrance/Exit doors of the Upper duplex rooms is not obstructed at any given time in case of any exigencies.

#### **5. CAR PARKING:**

- a) Car parking is permitted only in the designated area.
- b) Drainage of the car parking area of all the levels are laid independent from that of the buildings & it is provided with catch pit & fire trap before connecting to the building drainage or Municipal drainage.
- c) Drainage of the car parking areas at all the levels are so laid as to prevent any overflow in the staircase, lift shaft etc.
- d) Dwelling, use of naked light/flame, repairing /maintenance of vehicles are strictly prohibited in the parking area.
- e) The drive way is properly marked & maintained unobstructed all the time.
- f) The Automatic Sprinkler System is provided to the entire car parking area.

#### **A) PODIUM /CAR PARKING FLOORS (If Provided)**

- i. All the sides of the stilted / covered car parking are kept open except parapet walls of not more than 0.75 meters height.
- ii. Automatic sprinkler system to the entire parking floor & drencher system on the top of each podium floor are provided as per IS standards.
- iii. The driveways is properly marked and maintained unobstructed. Proper signage's are provided for escape route, ramps etc at prominent location.
- iv. Fins shall be as per provisions vide CHE/DP/Gen/110-2019-2020, dated 30.01.2021 (C-10).

- v. Fins if provided shall be non-combustible material or shall be treated with Fire Resistant paint of 01 hour rating.
- vi. Drencher system is provided internally on the periphery at the top of the car parking as well as if adjoining the building then to be provided in between the building and car parking.

**B) STACK / PUZZLE / ROTARY CAR PARKING (IF provided)**

- i. The design & construction of the stack / puzzle / rotary car parking shall be as per prevailing codes & standards.
- ii. Elements of the car parking structure are 2 hr. fire resistance.
- iii. Each car parking deck is 2 hr. fire resistance.
- iv. Each car parking shall be protected with medium velocity water spray projector system as per prevailing codes & standards.
- v. Separate external staircase up to top of the Car Parking Tower is provided along with a platform of width minimum 0.90 mtrs.
- vi. Heat detectors shall be provided as per IS Standards.
- vii. Medium Velocity water spray system is provided internally on the periphery at the top of the car parking tower as well as if adjoining the building then to be provided in between the building and car parking tower.
- viii. Dry Riser of dia. 10 cms. is provided to the Car parking tower having hydrant outlet at each parking level accessible through the platform.

**6. STAIRCASE: -**

- a. The layout, flight width etc. of staircase is as per Regulation 37(15) & 47 of DCPR- 2034.
- b. Externally located staircases adequately ventilated to outside air.
- c. Permanent vent provided at the top equal to 5 % of the cross sectional area of the staircase.
- d. Openable sashes or R.C.C. grills provided with clear opening of not less than 0.5 sq. meters per landing on the external wall of the staircase.
- e. No combustibles kept or stored in staircases / passages.
- f. Staircase lobby is provided with smoke check lobby at basement level.

**Terrace door: -**

- a. The top half portion of the doors provided with louvers.
- b. The latch-lock installed from the terrace side at the height if not more than 1 mtrs.
- c. The glass front of 6 inch diameter with the breakable glass is provided just above the latch lock, so as to open the latch in case of an emergency by breaking glass.

**7. CORRIDOR / LIFT LOBBY: -**

- a. Corridor/lift lobby at each floor level is adequately ventilated as per the provisions of DCPR-2034.
- b. The common corridor/lift lobby at each floor level is kept free from obstructions at all times.
- c. Proper signage provided for way to staircase, escape routes, staircase, floor nos. etc. at each floor of building.
- d. Portable lights/insta lights are provided at strategic locations in the staircase and lift lobby.

**8. STAIRCASE AND CORRIDOR (ESCAPE ROUTES) LIGHTINGS: -**

- a. The staircase and corridor lighting is on separate circuits and shall be independently connected so that they could be operated by one switch installation on the ground floor easily accessible to firefighting staff at any time irrespective of the position of the individual control of the light points, if any.
- b. Staircase and corridor lighting are connected to alternate supply.
- c. Double throw switches is installed to ensure that lighting in the staircase and the corridor do not get connected to two sources of supply simultaneously. A double throw switch is installed in the service room to terminate the standby-supply.
- d. Emergency lights are provided in the staircases/corridors.

**9. FLATS / SHOPS / OFFICES MAIN ENTRANCE DOORS, STAIRCASE ENTRANCE & KITCHEN DOOR: -**

- a. Entrance doors for flats / office / non-residential units shall be of solid core having fire resistance of not less than one hour as per IS Standards.
- b. The fire resistance rating for staircase ,Lift lobby / protected lobby & the lift doors as per N.B.C. provisions

**10. ELECTRIC CABLE SHAFTS, SERVICES & METER ROOM: -**

- a. All the electrical cables shall be provided in the sealed casing or shall be concealed type or in the dedicated electrical shafts.
- b. In case the electric shaft is provided, the same is open in staircase enclosure.
- c. Inspection doors for shafts is having two hours fire resistance.
- d. Electric shafts is sealed at each floor level with non-combustible materials such as vermiculite concrete. No storage of any kind is kept in electric shaft.
- e. Electric meter room / panel / box are shown on the plan. It shall be adequately ventilated & easily accessible.
- f. Electric wiring / electrical installation is as per prevailing Indian Electricity Act and Rules and the certificate to that effect is obtained from authorized electrical contractor / electrical authority at the time of compliance application.
- g. Electric wiring shall be fire resistance and low smoke hazard cables (FRLS) type.
- h. Low & medium voltage wiring running in shaft & in false ceiling should run in separate conduits.
- i. Water mains, telephone lines, intercom lines, gas pipes or any other service line should not be laid in the duct for electrical cables; use of bus bar / solid rising mains instead of cables is preferred.
- j. Separate circuits for fire-fighting pumps, lifts, staircases & corridor lighting is provided directly from the main switch gear panel and these circuits shall be laid in separate conduit pipes, so that fuse in one circuit will not affect the others. Such circuits are protected at origin by an automatic circuit breaker with its no-volt coil removed.
- k. Master switches controlling essential service circuits are clearly labelled & provide in the lobby for emergency operations.

**11. FALSE CEILING (if provided): -**

- a. False ceiling if provided in the building shall be of non-combustible material.
- b. Similarly, the suspenders of the false ceiling shall be of no combustible materials.

**12. MATERIALS FOR INTERIOR DECORATION/FURNISHING (if provided): -**

The use of materials which are combustibile in nature and may spread toxic fume/gases should not be used for interior decoration/furnishing.

**13. LIFT: -**

**A. PASSENGER LIFT:**

- i. Walls enclosing lift shaft shall have a fire resistance of not less than two hours.
- ii. Shafts shall have permanent vent of not less than 0.2 sq. mtrs in clear area immediately under the machine room.
- iii. Landing doors and lift car doors of the lifts are steel shuttered with fire resistance of one hour. No collapsible shutters are permitted.
- iv. One of the lift is converted into fire lift and shall be as per specifications laid down under the regulations, a toggle switch shall be provided to this lift for the use of Firemen.
- v. Threshold of non-combustible material is provided at the entrance of each landing door.

**B. FIRE LIFTS (above 24 mtrs.):**

- i. All materials of constructions in load bearing elements, stairways and corridors and facades shall be non-combustible.
- ii. The fireman lift shall have a floor area of minimum 1.43 m<sup>2</sup>. It shall have loading capacity of not less than 544 kg (8 persons lift).
- iii. There shall be at least one fireman lift each wing of the building. If there are multiple banks of lifts in the building there shall be at least one fireman lift per bank of lifts.
- iv. The interior finishing materials shall be of very low flame spread type.
- v. Walls of the lift bank well enclosure for a lift or group of lifts shall have a fire rating of 120 min. The lift well shall have a vent at the top, of area not less than 0.2 m<sup>2</sup> per lift.
- vi. Landing doors, Lift landing doors shall be imperforate. Collapsible doors shall not be permitted. Lift landing doors provided in the lift enclosure shall have a minimum fire resistance rating of 60 min.
- vii. Lift car doors shall be imperforate. Collapsible car doors shall not be permitted.
- viii. Two ways communication system shall be provided through intercom.
- ix. Photo luminescent safety signs shall be posted and maintained on every floor at or near the lift indicating that in case of fire, occupants shall use the stairs.
- x. All lifts (fireman's lifts/non fireman's lifts) shall be provided with Phase I operation as per NBC-2016, 7.1.1(k)(x) (grounding operation).
- xi. The grounding operation may be initiated by individual switches for lifts or a common switch for a group of lifts or by a signal from fire alarm system of the building if available.
- xii. Reliable alternative source of power supply should be provided for all fireman lifts through a manually/automatically operated change-over switch. The route of wiring shall be safe from fire.
- xiii. The words 'Fireman Lift' shall be conspicuously displayed in fluorescent paint on the lift landing.
- xiv. The firemen lift is provided in a building for the purpose of aiding fire fighters in evacuating trapped persons in the building and to take the equipment for fighting fire to upper levels with minimum delay. Some lifts out of all the lifts shall be identified as fireman lifts. The number of required fireman lifts and their locations in a building will vary depending on the size, design, complexity of the building.
- xv. The speed of the fire lift shall be such that it can reach the top floor from ground level within one minute.
- xvi. Collapsible gates shall not be permitted for lifts; the lifts shall have solid doors with fire resistance of at least one hour.

#### **14. BASEMENT:**

- a. Each basement shall be separately ventilated. Vents with cross, sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly around the perimeter of the basement shall be provided in the form of grills or breakable stall boards lights or pavement lights or by way of shafts. Alternatively, a system of air inlets shall be provided at basement floor level and smoke outlets at basement ceiling level. Inlets and outlets may be terminated at ground level with stall boards or pavement lights as before but ducts to convey fresh air to the basement floor level shall have to be laid. Stall boards and pavement lights should be in position easily accessible to the Fire Brigade personal and rescue teams and clearly marked 'SMOKE OUTLET' or AIR INLET' with an indication of area served at or near the opening.
- b. The staircase of basements shall -
  - i. be of enclosed type having fire resistance of not less than two hours;
  - ii. be situated at periphery of the basement to be entered at ground level only from the open air and in such a, position that smoke from any fire in the basement shall not enter and exit serving the ground and upper storeys of the building; and
  - iii. communicate with basement through a smoke check lobby provided with fire-resisting self-closing doors of one hour fire resistance. If the travel distance exceeds the values mentioned in Regulation No 47(3)(i)(ii) & (i & ii), additional staircases at proper places shall be provided.
- c. Intake ducts may serve all basement levels but each basement and basement compartment shall have separate smoke outlet duct or ducts.
- d. Mechanical extractors for smoke-venting system from lower basement levels shall also be provided. The system shall be of such design as to operate on actuation of heat sensitive detectors or sprinklers if installed and shall have a considerably higher performance than the standard units. The system should also have an arrangement to start it manually and shall be designed to function at a temperature not less than 550°C.
- e. Compartmentation is provided as per NBC part-4 (4.5.2)
- f. Fire lift not communicated with basement.
- g. Kitchens working or gas fuel not permitted in basements.
- h. Smoke check lobby, Staircases, common passages & escape routes of the entire basement are painted with fire retardant paint.
- i. One Dry Chemical Powder fire extinguisher ABC type of 09 kgs. Capacity each is kept for every 100 Sq. Mtrs. area in basement area.
- j. Staircase and lift lobby is illuminated by inverter operated exits signs with IP 54 enclosure. Luminance of the signage's are visible from a distance of 12 to 16 meters.
- k. If parking is proposed in the basement, CO Detector with audible alarm system is provided to all the basement areas and the circuit of the same is given/connected to mechanical ventilation system to start automatically on actuation of CO detector and the other detectors provided in the basement.
- l. The basement beyond building line are paved, suitably to bear the load of fire engines weighing upto 28 m. tonnes.
- m. Emergency Evacuation basement plans are displayed in each basement at easily accessible locations showing exit routes.
- n. The Automatic Sprinkler System / High Pressure Water Mist system is provided to the entire basement area.
- o. Stack car parking (if provided) is protected with water spray projector system or double line sprinkler system

**15. FIRE FIGHTING REQUIREMENTS: -**

**a. UNDER GROUND WATER STORAGE TANK (if basement / tower parking / mechanized puzzle car parking is proposed OR in case of multiple wings (as specified below in d(2))): -**

An underground water storage tank of 25,000 liters capacity is provided for Wet riser for parking tower & sprinkler system/ Drencher system for the podium/ parking floor at the location marked in the plan, as per the design specified in the rules with baffle wall and fire brigade collecting breaching.

**b. OVERHEAD TERRACE WATER STORAGE TANK: -**

Another tank of 15,000 liters capacity is provided on staircase shaft at the terrace level, the layout of which shall be got approved from H. E.'s departments prior to erection. The tank shall be connected to wet risers through a booster pump through a non-return valve with provision of gate valve.

**c. DOWN COMER (Separate for Hydrant & Sprinkler Risers): -**

Down Comer of internal dia. of 10 cms. of G.I. 'C' Class pipe is provided in the duct adjoining the staircase as shown on the plan with a single hydrant outlet & hose reel at each floor level in such a way as not to reduce the width of the common corridor. Pressure reducing discs or orifices shall be provided at lower level, so as not to exceed the pressure of 5.5 kgs per sq.cms. The Down Comer is extended from lower basement up to topmost floor/terrace level.

**d. AUTOMATIC SPRINKLER SYSTEM: -**

- i. The Automatic sprinkler system is provided in basement, in car parking areas/Tower, in each Non Residential unit / Shop, as per the standards laid down by T.A.C. or relevant I.S. specifications.
- ii. Sprinkler system is provided in each habitable room of each flat and common corridor on every floor (for those wings not abutting directly on the road), if the building is having multiple wings, and all the wings are not abutting on the road side / all the wings are not interconnected on each floor / adequate open space for movement of the Fire Engine is not provided.

**e. AUTOMATIC SMOKE DETECTION SYSTEM: -**

Electric meter room, Lift machine room, pump room, Society office, store rooms, Gymnasium, Sub-station are protected with Automatic smoke detection system with main console panel at ground floor level.

**f. FIRE SERVICE INLET: -**

- i. A fire service inlet on the external face of the building near the tank directly fronting the courtyards is provide to connect the mobile pump of the fire service independently to a) the riser/ down comer, b) sprinkler system & c) drencher system.
- ii. Breeching connection inlet is provided to refill U.G. tank.
- iii. Operating switches of fire pumps are provided in glass fronted boxes at ground floor level.

**g. BOOSTER PUMP (DOWN COMER & SPRINKLER): -**

- i. Booster pump of 900 liters/min. capacity giving a pressure of not less than 3.2 kgs./ sq. cms. at the top most hydrant out let of the down comer is provided at the terrace level.

- ii. Booster pump of suitable capacity is provided for automatic sprinkler system at basement / drencher for podium / water spray projector for stack parking / side-line risers and sprinklers for parking tower / side-line risers and sprinklers for pit car parking / riser of the parking tower.
- iii. Electric supply (normal) to these pumps is kept on independent circuit.
- iv. Operating switches for booster pumps are also provided in glass fronted boxes at ground floor and on terrace level.
- v. Operating switches of fire pumps are also provided in glass fronted boxes at ground floor.
- vi. The fire pumps provided are surface mounted type or vertical turbine mounted type. Pumps used for fire-fighting installation shall not be of submersible type.

**h. EMERGENCY ESCAPE ROUTE PLAN: -**

Emergency escape route plan framed in glass is displayed in the common corridors, cross passages, staircase/lift lobbies of each floor level.

**i. EXTERNAL HYDRANTS: -**

Courtyard hydrants are provided at distance of 30.00 mtrs on ground floor level within the confines of the site of the down comer as well as in the basement.

**j. ALTERNATE SOURCE OF POWER SUPPLY (Above 24 MTRS): -**

An alternate source of L.V./H.V. supply from a separate substation or D.G. Set with appropriate change over switch is provided for fire lift, sprinkler pump, booster pump, jockey pumps, staircase and corridor lighting circuits, manual fire alarm system, detection system & P.A. system. It shall be housed in a separate cabin / cabinet at least 03 mtrs. Away from Electric Meter Box / Cabin.

**k. FIRE ALARM SYSTEM: -**

The entire building is provided with manual fire alarm system with main control panel at ground floor level and pill-boxes and hooters at each upper floor level. The layout of fire alarm system shall be in accordance with I.S. specification.

**l. PORTABLE FIRE EXTINGUISHERS: -**

- i. One Dry Chemical Power (A.B.C.) type fire extinguisher of 09 Kgs. capacity having B.I.S. certification mark and two buckets filled with dry, clean sand shall be kept each in the electric meter room, Lift Machine room & pump room.
- ii. One Dry Chemical Powder (A.B.C.) type fire extinguisher of 09 Kgs. capacity having B.I.S. certification mark shall be kept each in welfare centres, store rooms, Gymnasium etc. at each floor level in the entire building.
- iii. One Dry Chemical Powder fire extinguisher ABC type of 6 Kgs. capacity each shall be kept for every 100 Sq. Mtrs. area in basement area as well as Car-parking area on ground floor/ Podium level.

**m. PUBLIC ADDRESS SYSTEM: -**

The entire building is provided with the public address system in common areas as per the with main control operator at console panel at ground floor reception area.

**n. SIGNAGES: -**

Self-glowing/fluorescent exit signs in green colour are provided showing the means of escape for entire building as per prevailing IS Standard.

**o. HOSE & HOSE BOX: -**

One Hose Box with four hoses of 15 mtrs. length of 63 mm dia. along with branch are provided near down comer landing valve on ground floor at easily accessible place.

**p. TRAINED SECURITY GUARD: -**

Trained security/fire supervisor along with trained staff having basic knowledge of fire-fighting & fix fire-fighting installation are provided/posted in the building. They will be responsible for the following;

- i. Maintenance of all the first aid firefighting equipment's, fixed installations & other firefighting equipment's/appliance in good working condition at all times.
- ii. Imparting training to the occupants of the building in the use of firefighting equipment provided on the premises & kept them informed about the fire & other emergency evacuation procedures.
- iii. To liaise with the City Fire Brigade on regular & continual basis.

**q. FIRE & EVACUATION DRILL: -**

Fire/evacuation drills are conducted regularly & log of it shall be maintained.

**16. REFUGE AREA:**

**Terrace floor of the building shall be treated as Refuge Area & shall be provided as under:**

- a. The necessary facilities such as emergency lighting, drinking water etc. are provided.
- b. The access door/s from the enclosed staircase/s to the terrace floor shall have louvers at top half portion of the door. The entrance doors to the terrace is painted or fixed with sign painted in luminous paint mentioning "REFUGE AREA".

**17.D.G. Set / Room**

- a. Entire installation of DG set including Switchgear room, capacitors & transformer etc. shall be conforming to the prevailing Indian Electrical Act / Rules in practice.
- b. A deep tray is kept under the fuel tank of the DG set to collect the spillage and the same shall be disposed off daily without fail.
- c. The capacity of the DG set is as per concerned authority's requirements.
- d. Adequate ventilation for Switchgear room is essential to prevent condensation.
- e. The door of DG Set room is 2 hrs. fire resistance.
- f. Exhaust of the DG set is not be directed into the exit/entrance or any adjoining structures.
- g. Sand bed of at least 6 inch thickness is provided below the DG set.
- h. Electric cable of the DG set is of Fire Resistant & Low Smoke hazard type.
- i. Automatic built-in circuit breaker shall be provided to the DG set.
- j. Two dry chemical powder (ABC type) fire extinguishers of 09 kgs. capacity each with ISI certificate mark and Two AFFF Foam extinguisher with ISI certificate mark coupled with four buckets filled with dry, clean sand are kept in the DG set room.

**18. Electric Sub-station (Dry Type)**

- a. Only dry type transformers shall be installed.



- b. Entire installation of substation including switchgear room, capacitors, transformer etc. shall be conforming to the prevailing Indian Electric Act/Rules in practice.
- c. Cables in the cable trenches shall be coated with fire retardant material.
- d. Automatic built-in circuit breakers shall be provided in the substation /transformer.
- e. The door of the sub-station shall be of two hours fire resistance.
- f. The substation/transformer area shall be kept prohibited and no unauthorized person shall be allowed to enter in the area.
- g. Ventilation shall be provided at the ceiling level.
- h. The area provided for the installation of transformer shall be suitably hardened with RCC and the same shall be covered with sand bed having thickness not less than 15 cms.
- i. HV/LV cable ducts shall be as per Indian Electricity Rules.
- j. The danger signage on the substation fencing along with the electric voltage load.
- k. The pipe/trench connecting the catch pit from each of the transformer shall be of non-combustible construction and shall be provided with flame arrestor.
- l. Cable trenches shall be filled with sand, pebbles or similar non-flammable materials and covered with incombustible slabs. If a number of cables are taken in a trench, it is desirable that cables are taken on the racks. Electrical cable laid in the cable trenches shall be coated with fire retardant material.
- m. Automatic built in circuit breakers shall be provided in the transformers
- n. Four dry chemical power type (ABC stored pressure type) fire extinguishers of 9 kgs. Capacity each with ISI certification mark coupled with four buckets filled with dry clean sand shall be kept on the sub-station.
- o. Transformers shall be suitably insulated and shall be designed for continuous operation at rated KVA at the secondary terminal under the prevailing service condition at a higher rated voltage.
- p. All accessories/parts of the switchgear and transformer shall be inspected frequently and carefully for signs of overheating, tracking etc.
- q. The design, treatment and construction of the transformers and breaking of the winding shall be such as to withstand the heavy, mechanical and thermal stresses, which may be experienced under the condition of daily cycle heating and pulling due to fluctuation in load of dead short circuit on either side of the transformers
- r. Manual call points, exit directional signs shall be provided and maintained in good working condition all the time.
- s. Protective screens made up of non-combustible material shall be installed around each transformer, which will come into operation automatically on actuation of fire detection system.
- t. Smoke detection system shall be installed in the electric substation as per I.S. specifications.
- u. Automatic high pressure water spray system (Emulsifying) shall be provided.
- v. Electric Sub-Station area shall be kept prohibited and no unauthorized person shall be allowed to enter in the area.

**NOTE –**

- 1. These codified requirements are general fire safety requirements for residential low-rise buildings. However, Fire & Life Safety Auditor shall recommend necessary requirements as applicable for the proposed building on case-to-case basis.**
- 2. Photographs / videos / test certificates / reports, etc., shall be submitted to the Fire & Life Safety Auditor at the time of Compliance.**
- 3. Separate necessary permissions from competent Municipal Authorities shall be obtained for the various trade activities u/sec. 390 / 394 of MMC Act if carried out in the said proposed building.**
- 4. Separate necessary permissions from competent Municipal Authorities shall be obtained for the Swimming Pool if proposed in the said building.**