Fire Fighting Norms

1. All provisions of Fire NOC to be adhered, other than those that are in conflict with NBC or the exceptions listed below in pt. 3.
2. In case of conflict between Fire NOC and NBC, follow NBC.
3. Permissible exceptions to NBC or Fire NOC:
    a. In case where cluster of closely spaced buildings are planned, a common centralized fire fighting system has to be designed rather than a stand-alone system for each building.
    b. Fire Doors to staircase to have panic bar only in case of office and retail developments and hi-end/luxury residential. In all other cases, a simple hinge mechanism is acceptable for a fire door with the door openable from both sides with door closure.
    c. In basement parking areas, fire compartmentalization of max. 3,000 sq. mtrs.
    d. In parking areas with mechanical ventilation, following air-changes per hour are required:
        i. 6 – in normal scenario
        ii. 12 – in fire scenario
    e. In multi-building projects, it can be assumed that 1/4th of the wings (subject to minimum of 1) shall be on fire simultaneously. (Note: In parking podium/basement, it can be assumed that only one of the zones shall be on fire simultaneously).
    f. Hybrid Fire Alarm system shall be implemented for car parking areas (basement/podium) as a cost saving option. For residential/office development if basement/podium forms integrated part of the building plant then fire alarm loop from the building should be extended to cater the basement/podiums.
    g. If requirement is not as per international standards AND not part of NBC
    h. If requirement will lead to higher risk to the occupants, if implemented.
    i. If condition is physically not possible to meet.

Further, in case of g, h and i all attempts will be made to get the conditions modified by giving appropriate examples and explaining to the authorities prior to issuance of the NOC (or within 3 months thereafter). If change not made within 3 months from date of NOC, exception note shall be approved by COO/Director and kept with MEP.

4. Fire fighting tanks should be sized as per NBC for initial space planning if CFO NOC is not available. Tank size to be revisited after receipt of CFO NOC to ensure that the provisions are complying with CFO requirements.
5. Pumps and their back-ups to be provided as follows:

   Fire pump (electrical): 2 working (1 for sprinkler + 1 for hydrant) + 1 common stand-by connected to common header. (Pump room to be oversized for temporary placing of one additional pump if CFO NOC calls for 2 working + 2 standby). In buildings where entire floor is sprinkled , two systems will have to be independent of each other except for their interfacing thru fire alarm panel and fire fighting pumps should work on Auto ON and manual OFF. All Fire pumps (Sprinkler, Hydrant and common stand by) serving from UGT, Terrace and also serving large basements shall be IS certified pumps.

   a. Fire pump (Jockey): 1 working + 1 standby (pump rooms to be oversized for temporary placing of 2 additional jockey pumps if CFO NOC calls for 2 jockey + 2 standby).
   b. Fire pump (booster): 1 working + 1 standby : The starting of terrace booster pump should be automatic with pressure switch incorporated in down-comer side so that with opening of any hydrant valve ,or hose reel on any floor, it will start automatically with fall in line pressure. In addition, there should be a manual push button starter in the starter control panel to be located on ground floor (preferably meter room) of building. Stopping of pump should be by a push button located in the same starter panel manually

6. Fire hose cabinet station/wet riser shaft shall be of clear size 650mm (D) x 1200 (W) mm min. which will be located within core and next to staircase. Internal Projection beams/ structure inside the shaft shall be avoided.

   All internal riser floor penetrations shall be fire stopped (with 2Hrs/as per CFO NOC) material @ each floor.

7. Covered Parking Areas:
   a. Sprinklers
   b. Hydrants with 30 m coverage near each exit staircase and then additional hydrants at 30 m distance within the basement. Fire compartmentalization - REFER Item 3.c
   c. In parking areas with mechanical ventilation, - REFER Item 3.d
   d. Plant/Service Rooms:
   a. Sprinkler if required as per CFO NOC.
   b. Heat Detector
   c. Fire Extinguisher
   d. Fire extinguisher outside the plant room – type to be determined depending on the type of fire which is sought to be dealt with.
8. End suction pump to be considered for pump head up to 120m and above 120m pump head MSMO (Multi stage multi outlet) pump to be considered.
9. Standard response sprinkler to be considered for light and ordinary hazard.
10. Application of automatic detectors shall be as per the following guidelines:
    a. Smoke detector
       i. Inside habitable areas (only where applicable)
    b. Heat detector

i. Kitchens
ii. Car parks, basements

c. Multicriteria detector
   i. Only if required by CFO NOC, to be agreed with HOC-MEP
   ii. Laboratories (in Schools
   iii. Electrical shaft

d. Beam detectors
   i. Theatres and Auditoriums
   ii. Attrium > 7mtrs

11. Addressable Fire Alarm system with voice evacuation integrated or interfaced (speakers/strobes with sounders only for common areas and not in flats). Wherever possible voice evacuation system can be merged with BGM through required interface to reduce the number of speakers and associated costs.
12. Escape route shall be clear of any material causing hindrance in escape.
13. All firefighting system shall have alternate power from utility – from 2 supplies points. General guidelines (as per NBC applicable in 2016 – if these guidelines are different from what is prescribed in the Fire NOC, NBC to be followed):

All heights are calculated as height above ground to top slab of last habitable floor	**Sprinkler**	**Fire alarm / Smoke Detector**	**Staircase**	**Other Guidelines**

Residential<15 m Office < 15 m and retail < 9 m	As per NBC	As per NBC	As per NBC	As per NBC
Residential 15.1-45 m	NA	NA	Fire hose cabinet with 30m coverage in/near Fire Staircase.	a. Down with booster pump at terrace
Residential 45.1 m – 100 m	In Lift Lobby and in all major rooms inside the unit. Flexible droppers shall be used in all KCA areas for ease of coordination with finishes during installation. Length shall be decided as per the design intent of respective project. Droppers shall be UL listed/ FM approved. In existing projects implementation of the same can be adopted without any additional cost implication. Isolation valve lock shield type to be provided in common lobby for bare shell apartment/office. The sprinkler pipe is to be painted same colour as	Smoke detector in all major rooms inside the unit, KCA, lobbies and plant rooms. Smoke detector shall be also be provided in bare & shell unit (residential & commercial). Terminal box will be provided at the entrance inside the apartment to isolate the apartment in case of any further work by the owner and to keep the Fire alarm system in operation	a. Pressurized staircase hooked onto fire alarm system. b. Fire hose cabinet with 30m coverage in/near Fire Staircase. c. CO2 -type 5 kg Fire extinguisher adjacent to staircase gate on each floor. d. Fire telephone jacks shall be provided inside the stair as per CFO NOC with minimum 2 nos handsets for development.	a. Doors to meter room and electrical duct (if opening into a fire escape staircase or passage thereto) should have a 2 hour fire rating with smoke seal. b. Addressable Fire Alarm system with voice evacuation (speakers/strobes with sounders shall be provided near the staircase. c. In all segment of building/tower one speaker in each apartment in the Foyer to the bedrooms/bedroom be provided. d. Integrated Voice

	the walls of the room and the pipe is to be run along the ceiling-wall junction so that it is as inconspicuous as possible. Bulkhead is to be used to camouflage the sprinkler pipe only if Designer apartment or non-bare shell Hi-end / Luxury residential. If bulkhead is already in the unit due to some other purpose (eg. DB cable), same can be used for sprinkler pipe also (subject to feasibility) – however, the bulkhead length shouldn't be further increased for purposes of sprinkler pipe.			annunciation in FAVA system is not mandatory, based on performance & cost effectiveness VA system can be selected. However interface with fire alarm panel with amplifier to be done as per system performance.
Residential 100 m+	As per 'Residential 45.1 m – 100 m'	As per 'Residential 45.1 m – 100 m'	As per 'Residential 45.1 m – 100 m'	a. No materials with fire rating < 1 hour to be used in the access path from unit to staircase. Unit Main door and Staircase doors to have 2 hour fire rating with smoke seal and other wood to be avoided in lobby

				design. If the access path from unit to staircase is sprinkled, requirement will only be limited to unit main door and staircase door having 2 hour fire rating with smoke seal – no other limitation on use of any material in the lobby. b. Further, doors to meter room and electrical duct (if opening into a fire escape staircase or passage thereto) should have a 2 hour fire rating with smoke seal. c Addressable Fire Alarm system similar to Residential 45.1 m – 100 m
Office > 15 m or retail > 9 m	As per NBC - Inside unit distribution of sprinkler and its piping shall be done as per coverage area.	As per NBC a. Control module in each unit looped with the building fire alarm system for detection and annunciation. VAS		

		(speakers/strobe with sounders) to be provided from common area loop) b. Each detector shall be left with 1 meter of extra cable to enable tenant to shift locations within the range. c. Zone addressable module shall be provided to cater additional detector requirement post bare and shell unit handover excluding signet.		
Covered parking areas	As per NBC	As per NBC		a. Hydrants with 30 m coverage near each exit staircase and then additional hydrants at 30 m distance within the basement.
Plant / Service Rooms	As per NBC	As per NBC		a. Fire extinguisher outside the plant room – type to be determined depending on the type of fire which is sought to be dealt with.

14. FF Piping Systems – material specifications:

	Low-Rise/Car Park (<=30 m)	**Mid-rise (30 m – 70 m)**	**High-rise (70 m – 150 m)**	**Very High Rise (150 m+)**
Fire risers	GI ERW pipes Class – B/as per CFO NOC (12 bar rated) with welded joints	GI ERW pipes Class – C (Working pressure up to 12 bars). With welded joints	GI ERW Pipes Class – C (Working pressure o be limited up to 12 bar). With welded and grooved flexible coupling at every 10 floors	GI ERW Pipes Class – C with grooved flexible fittings. (Working pressure to be limited to 12 bars with pressure break tank & stage pumping at intermediate mechanical floor).
Horizontal Piping	GI ERW pipes Class – B/as per CFO NOC with welded joints for sizes 50mm & above and threaded joints for sizes below 50mm.	GI ERW pipes Class – C with welded joints for sizes 50mm & above and threaded joints for sizes below 50mm.	GI ERW pipes Class – C with welded joints for sizes 50mm & above and threaded joints for sizes below 50mm.	GI ERW pipes Class – C with welded joints for sizes 50mm & above and threaded joints for sizes below 50mm.

For any additional requirements as per CFO NOC, analysis to be done of whether such requirements are needed as per international standards and then decision to be made in discussion with Director-Design.

15. Strategy of provision of Fireman's Access Window and Automated Smoke Vents in glazed buildings shall be provided only as per CFO NOC. The Architects and the Façade Teams shall ensure that adequate provisions are incorporated in the façade and the MEP design shall ensure provision of the Fire Alarm interfaces and power supplies at the required locations.

a. **Fireman Access windows (FA)** – An opening (sizing and set out dimensions to be aligned with applicable CFO NOC on project to project basis) to be provided on each floor with the following minimum particulars:
   i. Size: 1.5m x 1.5m or as per CFO NOC
   ii. Level: Bottom of window shall be1.2m from the ffl
   iii. Spacing between windows: 15m or as per CFO NOC (preferably limited to glazed façade)
   iv. Position: Facing road side as well as compulsory open spaces

   The operable panel shall be either left or right hinged to facilitate approach of the rescue cage/ ladder. The FA windows shall be manual or auto operated (integrated with the Automatic smoke detection system) depending upon the option selected as the cost comparison noted in item 3 below.

   Such operable panels shall be marked conspicuously so as to easily identify the operable panel from outside. (Refer drg SV/FA)

b. **Smoke vents (SV)** - The operable vent shall be of min 600mm depth below ceiling/false ceiling level or full length on the periphery of the façade, whichever is less. The SV shall be bottom hinged and shall always be auto operated, integrated with the Automatic smoke detection system to enable auto opening on detection/ sensing of smoke.

   ∑SV area can be 2.5% of floor area or less depending upon the selection criteria noted below.

c. Calculation for finalizing quantity of Smoke Vent (SV) & Fireman Access (FA) in a project:

   i. **Option 1**- Total area of SV (Auto Opening) + FA (Auto Opening) = 2.5% of floor area = A

   Area of FA required in a floor = $\frac{\text{Perimeter of glazing per floor}}{15\text{m}}$ X (Area of 1 FA window) = B

   Area of SV required in a floor = C = A - B

ii. Option 2 – Total area of SV (Auto Opening) = 2.5% of floor area

Total area of FA (Manual Opening) = (Perimeter of glazing per floor) / 15m X (Area of 1 FA window)

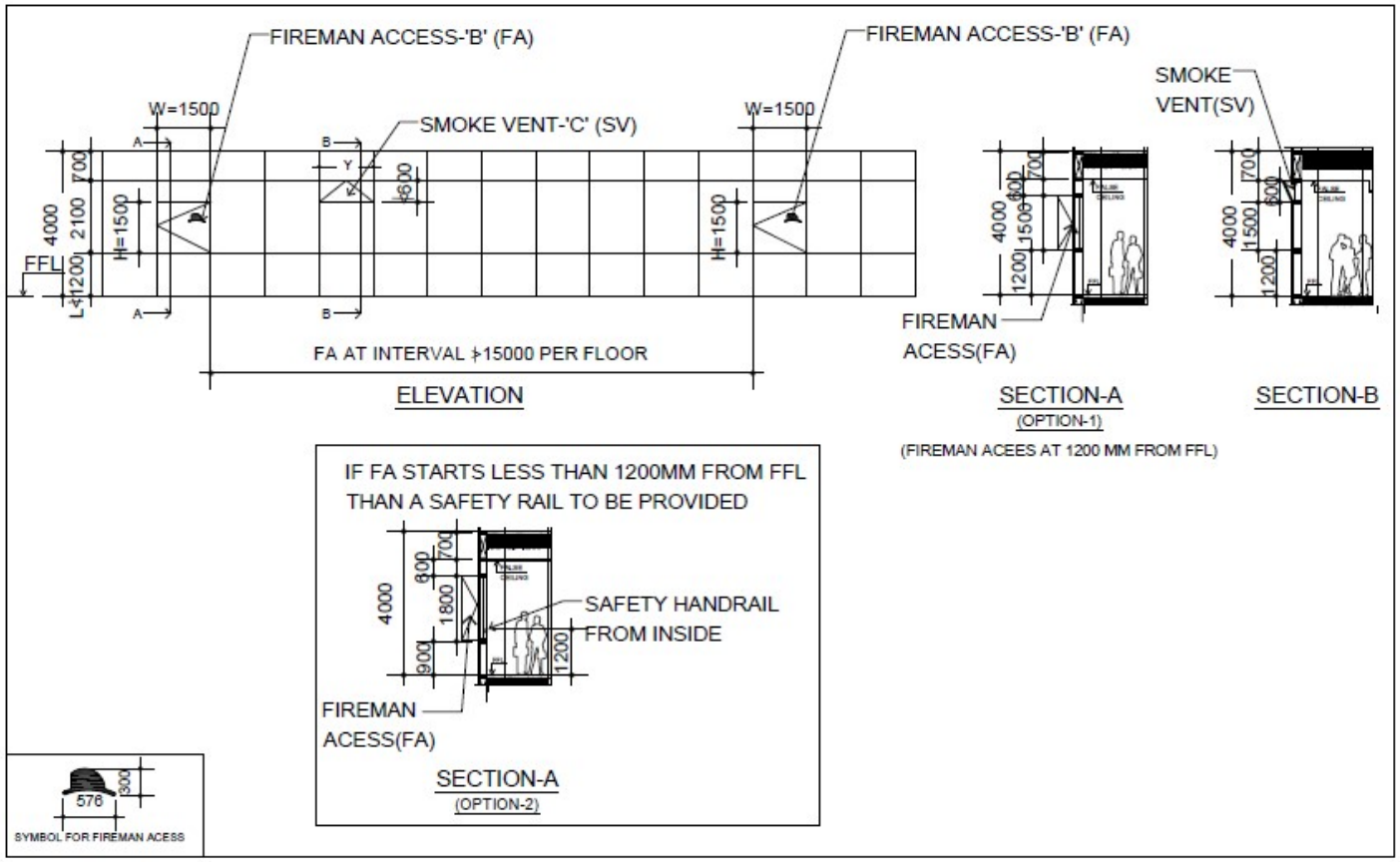
iii. Compare the cost for Option 1 & 2 and select the optimized option for the project.

iv. For Supremus format a minimum of one FA and/or SV shall be provided per office.

v. Water curtain system shall be provided from inside with deluge valve as per CFO requirement.

vi. Interface of deluge valve with FAVA system to be provided.

vii. Drencher system shall be provided for all the podium floors as per CFO requirements.



This policy updation (v9) shall be implemented as per Architectural policy no 122.