

SECTION 04 (Doc.No.A/DBR – 001)

# FIRE-FIGHTING DESIGN BRIEF REPORT

- 1.0 SCOPE
- 2.0 STANDARDS AND CODES
- 3.0 TYPES OF SYSTEM PROPOSED
- 4.0 FIRE HYDRANT SYSTEM
- 5.0 AUTOMATIC SPRINKLER SYSTEM
- 6.0 ADDRESSABLE FIRE DETECTION AND ALARM SYSTEM
- 7.0 TWO WAY PUBLIC ADDRESS SYSTEMS
- 8.0 PORTABLE FIRE EXTINGUISHERS
- 9.0 FIRE SIGNAGES
- 10.0 FIRE SAFETY PLAN
- 11.0 EMERGENCY ASSEMBLY POINT

## 1.0 SCOPE

The design of Fire Fighting System in respect of fire safety as the functional usage requires office building of large number of people at a single location and any emergency must be ensure minimum disruption in operations.

The objective of this report is to design a Fire Fighting system that shall provide:

- Life safety of occupants.
- Property protection.
- Compliance with all relevant statutory requirements.
- Minimum disruption during emergency to the operations.

## 2.0 CODES AND STANDARDS

The design and planning of Fire Protection, Detection & PA system shall be done keeping in view the following codes and standards (Latest editions):

- National Building Code: 2005 and local bylaws.
- BIS: 3844, 15105, 2189 and other relevant standards.
- Local Fire Authority.
- NFPA 13, Sprinkler System.
- NFPA 14, Hydrant System.
- NFPA 72, Fire Alarm System.
- NFPA 10, Fire Extinguishers.

### Hazard Classification

As per NBC this premises is classified as Business Occupancy, Group - E, Business building, Sub - division - E1, Office Building.

### 3.0 TYPES OF SYSTEM PROPOSED

OCCUPANCY	DESCRIPTION	AREA	REMARKS
Office Building	Fire Hydrant / Wet riser cum down comer / Yard Hydrant / Automatic Sprinkler / Fire Detection and Alarm / Two way Public addressable systems / Fire Extinguishers	All floor Area	

#### FIRE WATER STORAGE TANKS

SL, No	TANK CAPACITY	LOCATION	SYSTEM	REMARKS
1	200000 Litres	Basement	Hydrant & Sprinkler	<b>Combined Underground Sump</b>
2	25000 Litres	Terrace	Hydrant	Separate tank for tower -1 & 2

## FIRE WATER PUMPS

Fire pumps should deliver water at Terrace with minimum pressure of 3.5 bars. Fire pumps shall be horizontal centrifugal type coupled to suitable prime mover.

SL. NO.	DESCRIPTION	CAPACITY	REMARKS
1	2 No Electrically driven main pump for Hydrant system	100 mtr @ 2850 LPM	Combined Fire Pump Room
2	2 No Diesel Engine driven standby pump for Hydrant & sprinkler system	100 mtr @ 2850 LPM	
3	2 No Electrically driven main pump for Sprinkler system	100 mtr @ 2850 LPM	
4	2 No Electrically driven Jockey pump for Hydrant system	100 mtr @ 180 LPM	
5	2 No Booster pump	35 mtr @ 900 LPM	

2 No of Common compartmentalized Control panel located at pump house controls all pumps and further the status of pumps shall be extended to IBMS system for monitoring through the Fire alarm panel.

## 4.0 FIRE HYDRANT SYSTEM

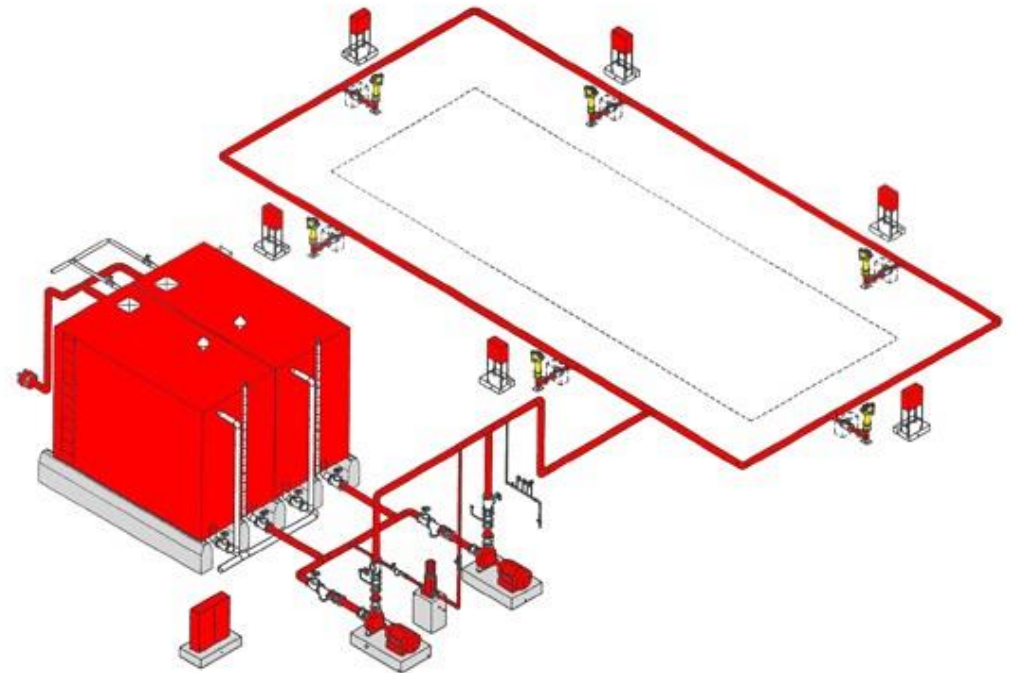
Hydrant system with ring main runs at basement ceiling level with isolation valves. The yard hydrant points shall be extended from the same mains and also the wet risers shall be connected from the mains with isolation valves.

Hydrant mains shall be G.I. heavy grade pipe with suitable type of fittings made of by same material. Underground pipes shall be treated for anti corrosive material.

System consisting of internal hydrants for all floor levels near staircase or corridor, External hydrants at suitable locations and Fire brigade inlet connection for emergency pumping to the system and for the fire tank.

### External Hydrants

Hydrants are proposed at every 45m of periphery of the Building to protect the building from outside with all accessories.



## WET RISER SYSTEM

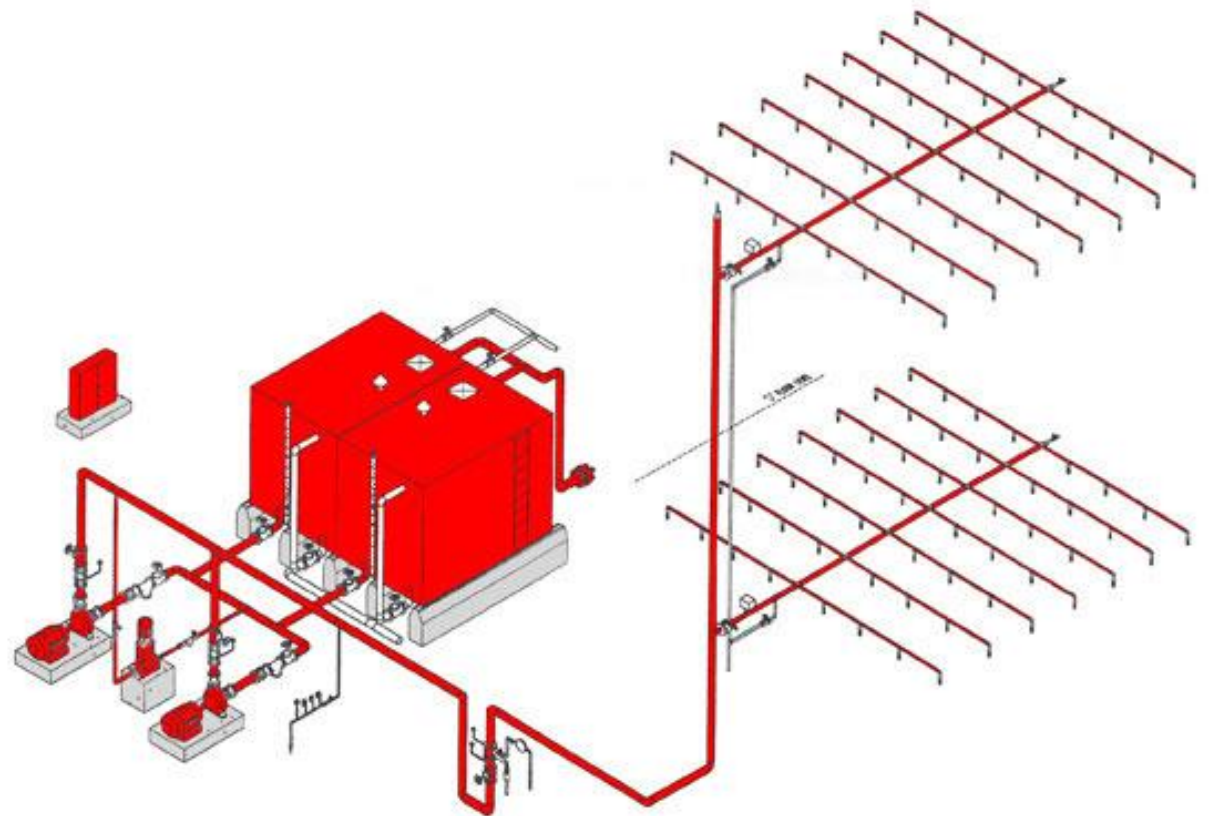
Wet riser shall be provided for every 1000 sq.mts floor area on all floors and shall running inside the dedicated shafts. Wet risers shall be minimum 150 mm diameter in size and shall run up to terrace and all risers to be connected to the ring main at terrace and connect to the terrace tank.

Internal Hydrant tapped from the risers with all accessories.

## 5.0 AUTOMATIC SPRINKLER SYSTEM

System consisting with Sprinkler mains pipes from pump room, piping network inside the floor area with properly designed pipe supports, Sprinkler control valve located outside the building and isolation valves. Sprinklers shall be standard response pendant type, 68 deg. C temperature rating and shall design to cover 9 to 12 sq. m.

At each floor sprinkler distribution header shall tapped off from sprinkler riser with isolation valves and flow switches on each distribution header and flow switch shall be connected to fire alarm panel to monitor in case of water flow in the event of fire.





## 6.0 ADDRESSABLE FIRE DETECTION & ALARM SYSTEM

Complete Analogue Addressable, zoned and electrically supervised, Class A, multiple loops Fire Alarm and Detection system, including initiating device and notification appliances shall be provided for Building.

The Fire detection and alarm system shall be consisting with the following,

- Addressable analogue Fire detection & alarm control panel.
- Smoke & heat detectors
- Manual pull stations (break glass type)
- Electronic Hooters cum strobes
- Conduits / wiring

**Note:** Separate Panel of Fire Alarm & PA System each tower.

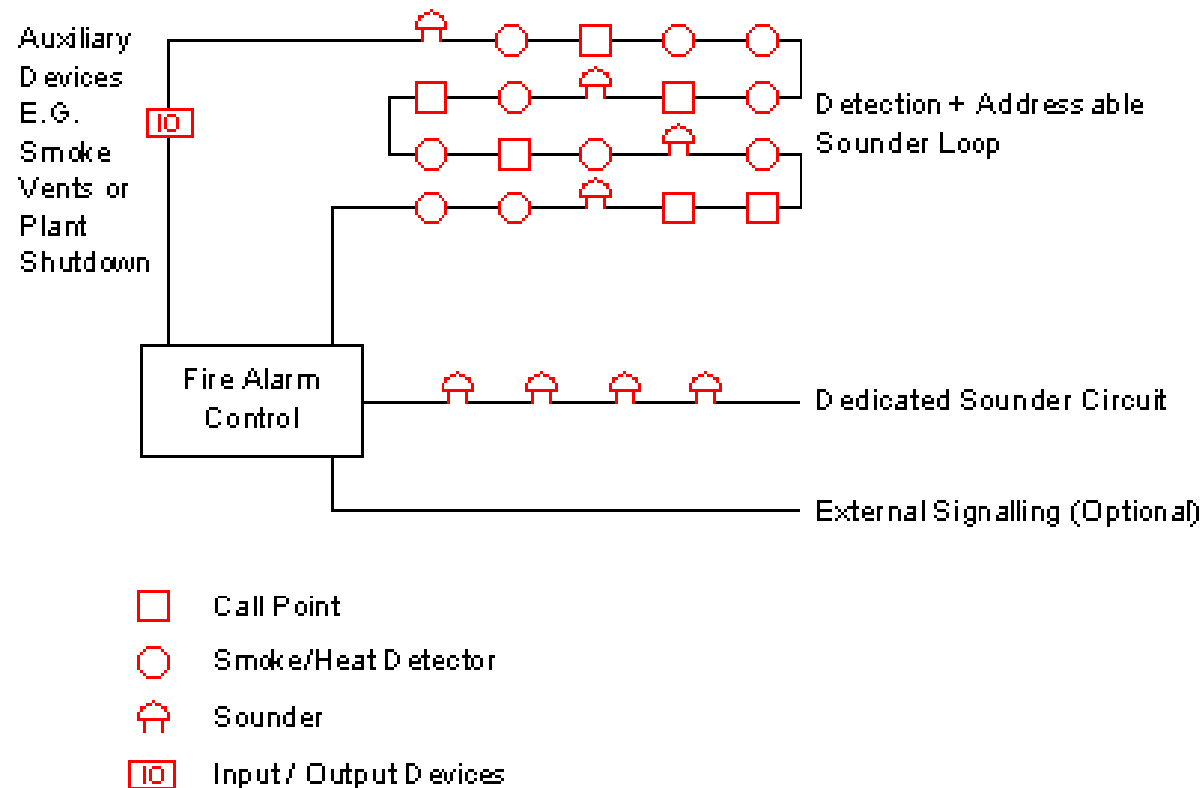
The main features of system shall be as under;

### **Interfaces**

Fire Alarm System Interface with third party Systems at Fire alarm Control Panel (FACP), and programmed from Network Control Station in Fire Control Room located at ground floor.

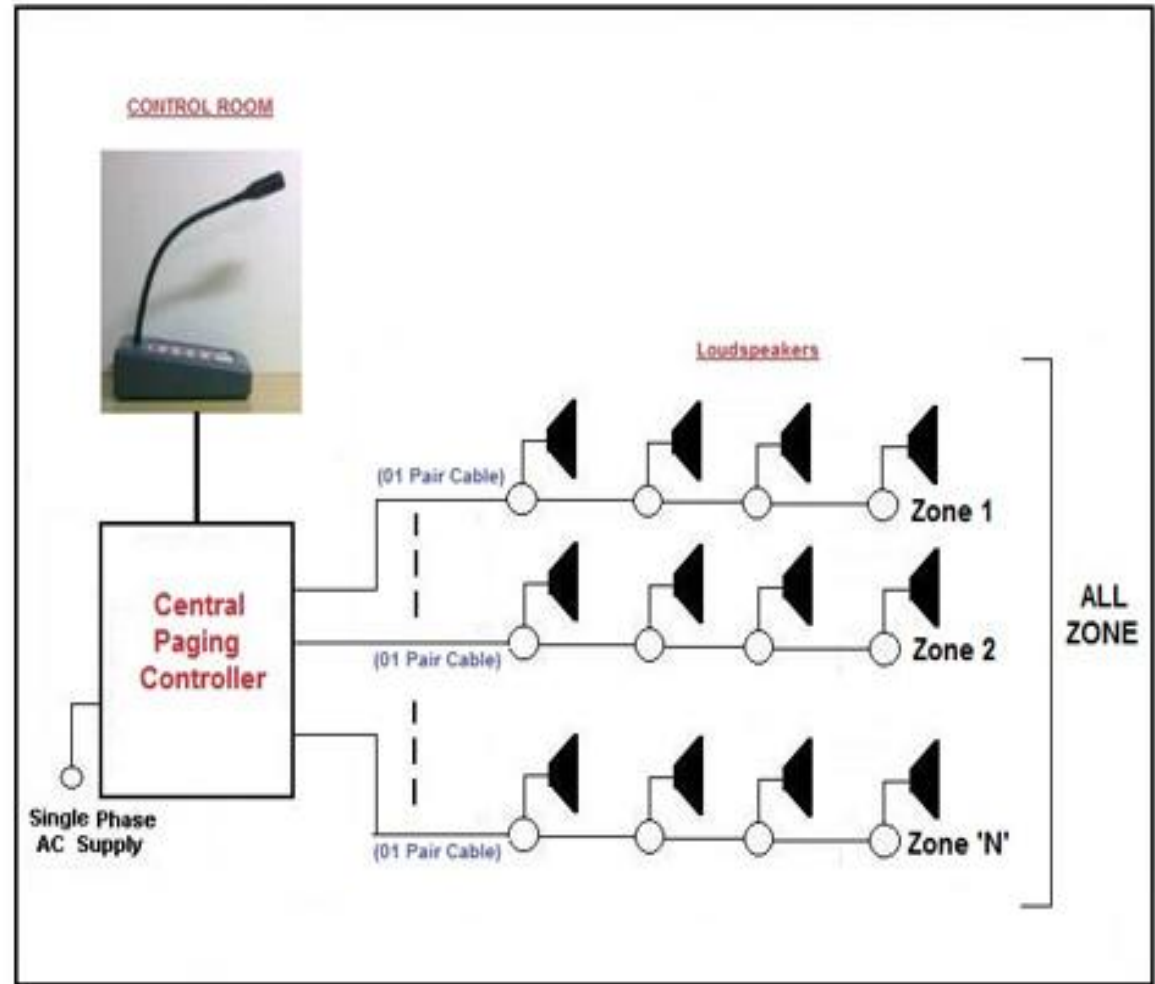
- a. Fire Pump Status: Each fire pump shall have status indication for power failure, pump running and phase reversal. An audible trouble signal shall sound until acknowledged and automatically restored. The running condition of pump shall be permitted to be alarm condition whereas all other status of pumps shall be permitted to be supervisory condition.
- b. The operation of Sprinkler Water flow switch, Valve supervisory switch and Pressure Switches shall cause an alarm / supervisory condition at Fire Alarm Control Panel.
- c. Elevator Recall for Fire fighter services; Primary main floor recall shall be activated on alarm by an elevator lobby or elevator machine room detector. Alternate floor recall shall be activated by detector in the main floor elevator lobby.
- d. Stair Pressurization: With-in a given zone, an automatic sprinkler system water flow switch, an open area smoke detector outside a pressurized stairwell shall activate the stair pressurization systems for that zone.
- e. AHU Tripping: Within a given zone, an automatic sprinkler system water flow switch, an open area smoke detector, shall switch off the Air Handling units of affected area and simultaneously the respective fire damper.
- f. External Dampers: Within a given zone, an automatic sprinkler system water flow switch, an open area smoke detector, shall switch off associated damper of duct crossing through fire resistant wall.

- g. Smoke Control System: Within a given zone, an automatic sprinkler system water flow switch, an open area smoke detector or the manual fan control at Fire Control Room shall switch OFF/ON the smoke control fan of associated Zone.
- h. Building Management System (BMS): Shall interface with building management system for monitoring of fire net by BMS.



## 7.0 PUBLIC ADDRESS SYSTEM

A public address system with a two ways communication facility comprises with speakers located at various strategic locations (near entry / exit / staircases) at all floors connected to a floor selector-switching console. The floor selector-switching console is interconnected to an amplifier of suitable wattage and a microphone. The system installed close to the fire alarm control panel. In the event of actuation of any detector or manual call point on a particular floor, the fire marshal or security personnel can select the public address speaker on the affected floor by operating the particular floor switch on the switching console.



## 8.0 PORTABLE FIRE EXTINGUISHERS

The portable fire extinguishers shall be provided as per NFPA 10, standards for portable fire extinguishers. However, additional fire extinguishers shall be provided as per requirement of local Fire Services.

SL. NO	TYPE OF FIRE EXTINGUISHER	PROPOSED LOCATION
1.	5 kg multipurpose ABC dry chemical type fire extinguishers	Staircase landing and office area
2.	4.5 kg or higher capacity CO2 fire extinguisher	Electrical Rooms
3.	9 lt. Aqueous film forming foam (AFFF) stored pressure type fire extinguisher	Generator room and fuel pump room
4.	5 kg or higher capacity Clean Agent Extinguishers	Fire Control room / Server and Data storage area



## 9.0 FIRE SIGNAGES

The signage's for during evacuation for each floor level to be provided in position the following type of sign boards made out of 3mm thick "Opaque" PVC foam board with PVC non-reflective self adhesive vinyl painted foam board.

1. Signage with printed "IN CASE OF FIRE, USE STAIRS UNLESS INSTRUCTED OTHERWISE" of 1.5cm height letters in red with white back ground. The size of the board shall be 25cm x 30 cm and shall be fixed at the height of 2mts. from finished floor near Manual call points.
2. Floor identification signage (i.e., GROUND FLOOR ...etc.) at each stair enclosure on every floor, indicating the floor number in words, lettering size shall be 7.5 cm with contrasting colour from back ground. Size shall be 15cm x 60cm.
3. Plant rooms and equipments room signage's need to be considered for identifications.

## 10.0 FIRE SAFETY PLAN

A Fire safety plan for preventing and extinguishing any accidental fire in the building and action to be taken by the occupants in case of such fire has been provided at strategic points, this shall be provided near each staircase area.



## 11.0 EMERGENCY ASSEMBLY POINT

An area at an appropriate place in the allowed/required setbacks shall be earmarked with a proper board as "ASSEMBLY POINT" for the occupants to assemble after evacuation during practice drill and in an emergency.

