Sample Tender Technical Specification for 20 storied Residential Apartment

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1.Name of work:

Design supply installation, testing and commissioning of Electronic Fire and Life Safety System as per NBC 2016. The system shall consist of Addressable Automatic Fire detection, MOEFA, and Emergency lighting System. MOEFA shall include Manual call point System, Public Address system and Talkback System.

2.Brief about Architecture of the building:

The residential apartment complex consists of a total of 23 floors. There are two basement levels allocated for car parking and a fire pump house. The ground floor is dedicated to reception and administrative offices.

The 20 floors above the ground level accommodate residential flats, with each floor comprising six three-bedroom flats. The size of each flat is approximately 2000 sq ft. The corridors and each flat are equipped with a sprinkler system, ensuring fire protection.

Individual flats have sprinklers with a flow switch. The terrace floor houses the lift room. Two rising stairs are provided, one equipped with a lift, and the other serving as the main emergency staircase. Each floor has an emergency exit with a fire door.

3.Fire Command and Control Center

Feature of Fire Command and Control System :

The Fire Command and Control Center serves as a remote monitoring and control hub, integrating all emergency management facilities to effectively address incidents, particularly fires.

Key Features:

Talkback System:

Two-way talkback speakers are installed throughout the building. When occupants need emergency assistance, they can activate the talkback call button, which triggers the system monitor to identify the caller's location. Control room personnel acknowledge the call and communicate with the caller to coordinate an appropriate response. Additionally, fire control room staff can use the talkback calling unit to contact one or more field talkback units during an emergency.

Public Address System:

Speakers are installed throughout the building to facilitate emergency communications with occupants. These speakers are zonally controlled, allowing for targeted announcements. Control room personnel can activate specific zonal speakers to deliver voice messages during emergencies. The control unit also has the capability to activate all speakers simultaneously for mass notifications.

Manual Call Point System:

Manual call points are installed throughout the building. If anyone detects a fire, they can activate a call point to alert the control room of the fire's location, allowing the fire warden to respond appropriately. Some buildings also feature a sector fire alarm panel that displays alarms for specific areas, assisting the sector fire warden in taking necessary actions alongside the FCC fire alarm monitor.

Automatic Fire Detection System:

Automatic fire detectors are strategically placed throughout the building to detect abnormal temperatures, smoke, flames, and the presence of toxic or flammable gases. When fire is is detected, the system sends a signal directly to the Fire Command Center (FCC) or through a sector fire alarm panel, indicating the fire's location and enabling a prompt response from the fire warden.

Sprinkler System Monitoring:

The sprinkler system serves as both a fire detection and suppression system. Sprinkler activation is detected using flow switches that send signals to the Fire Command Center (FCC). Maintaining water pressure throughout the sprinkler and hydrant pipelines is crucial. Pressure switches installed at various remote points along the pipelines will alert the FCC if low pressure is detected, prompting appropriate action.

Deactivation of Access-Controlled Doors:

Many doors in the building are equipped with magnetic locks for access control. To ensure the safe evacuation of occupants and allow entry for fire service personnel, a remote deactivation feature for these doors should be available at the Fire Command Center (FCC).

Elevator Emergency System:

If occupants become trapped in an elevator, they can activate the emergency call button located inside the lift car. The lift emergency monitoring unit identifies the lift number and current floor, enabling control room personnel to take appropriate action. The system also includes a talkback speaker for communication with control room staff.

Fire Pump House Monitoring:

A variety of parameters must be monitored during normal operations and fire emergencies, including water reservoir sump levels, diesel fuel levels, water pressure on the header, main pump start failures, main pump activation, and battery condition. Since the fire pump house is typically unmanned, remote monitoring from the Fire Command and Control Center is essential.

Fire Curtain System:

To create compartmentalization and control the spread of fire and smoke, water curtains or fiberglass cloth screens can be electrically activated. Monitoring and control of the curtain systems should be accessible at the Fire Command Center (FCC) as needed.

Smoke Ventilation System:

The smoke ventilation system is designed to clear smoke and is installed in various areas of the building, particularly in escape lobbies, staircases, and underground parking. These systems are electrically operated, and their monitoring and control should be accessible at the Fire Command Center (FCC).

Staircase Pressurization System:

A staircase pressurization fan introduces clean outside air into the stairwell during a fire, helping to push smoke back and keep it out of escape routes. These systems are electrically operated, and their monitoring and control should be accessible at the Fire Command Center (FCC).

LPG/CNG Piped Gas System Control:

The building utilizes a piped gas system for cooking and other purposes. In the event of a fire or gas leak, a remote shut-off facility should be accessible at the Fire Command Center (FCC).

CCTV Systems:

CCTV systems are extensively installed throughout the building. Monitors for these systems should be positioned at the Fire Command Center (FCC) to assist with various functions, particularly during emergencies.

Note:

Central fire command and control center

In building complexes with multiple high-rise towers, each individual tower should have its own ground-floor Fire Control and Command Center in addition to the central Fire Control and Command Center for the entire complex. Signals and controls from each tower's Fire Control and Command Center should be integrated with the central Fire Control and Command Center

Fire command and control room location Considerations

In a multistoried building, the fire command and control room is typically located on the ground floor or in a designated area that is easily accessible and centrally located. The key considerations for its placement include:

1. Accessibility: It should be easily accessible for firefighters and emergency personnel.

2. Visibility: It should be visible and not obstructed by other structures or equipment.

3. Protection: It should be located in a fire-resistant area to ensure its integrity during a fire emergency.

4. Communication: It should be situated where it can effectively communicate with all parts of the building and external emergency services.

NBC 2016 – Part 4 - 3.4.12 Fire Command Centre (FCC)

1. a) Fire command centre shall be on the entrance floor of the building having direct access. The control room shall have the main fire alarm panel with communication system (suitable public address system) to aid floors and facilities for receiving the message from different floors.

2. b) Fire command centre shall be constructed with 120 min rating walls with a fire door and shall be provided with emergency lighting. Interior finishes shall not use any flammable materials. All controls and monitoring of fire alarm systems, pressurization

systems, smoke management systems shall happen from this room. Monitoring of integrated building management systems, CCTVs or any other critical parameters in building may also be from the same room.

3. c) Details of all floor plans along with the details of firefighting equipment and installations (2 sets laminated and bound) shall be maintained in fire command centre.

4. d) The fire staff in charge of the fire command centre shall be responsible for the maintenance of the various services and firefighting equipment and installations in coordination with security, electrical and civil staff of the building.

4.Proposed type of systems :

Addressable integrated Electronic Fire and life safety System which shall comply NBC2016 and associated standards.

4.1 MOEFA – Manually Operated Electronic Fire Alarm System

4.1a Talkback System

4.1b Public Address System

4.1c Manual Call Point System

4.1 MOEFA

Talkback System

The objective of the Talkback System is to allow individuals requiring emergency support to use the nearest talkback speaker to communicate directly with ground floor security staff.

Public Address System

The objective of the Public Address System is to broadcast emergency messages to specific locations, zones, or all occupants as needed. Both the Talkback and Public Address Systems serve dual purposes, facilitating day-to-day communications in addition to emergency alerts.

Manual Call Point System

If a fire is noticed and is minor enough to be managed independently or with the assistance of security staff via the Talkback System, occupants shall not activate the Manual Call Point System unnecessarily, which may cause undue panic to others. If fire condition tend to escalate, manual call point system must be activated to alert neighboring occupants and ground floor security by activating nearby manual call point.

NBC 2016 Requirements:

– Voice alarms must be used instead of hooters or sirens, in English, Hindi, or local languages.
– Alarms should include flashing lights.
– Access controlled doors and emergency lighting must deactivate automatically during alarms.

Important Considerations:

– All fire warning system cables and instruments must have fault monitoring systems.
– Cables must be mechanically and fire-resistant to ensure functionality during fires.

Additional Recommendations:

– Regularly monitor the health of fire detection and warning equipment, including speakers and talkback systems.
– Avoid using systems that do not meet these standards, such as lifestyle commercial speaker systems or those lacking fault monitoring.

Items used for MOEFA

Manual Call Point, Talkback Speaker, PA Speaker, Short Circuit Isolator, Monitor module, Control module, Control Panel

4.1a Purpose of Talkback Systems

Objective
The purpose of installing a talkback system is to enable communication between occupants in trouble zones and rescue support staff.

System Components
The talkback system consists of hands-free units equipped with a speaker, microphone, and a single call button.

Master Control and Receiver Unit
The master control and receiver unit typically includes a handset or microphone and a panel speaker for two-way conversations. It features a display to indicate the caller's location and control buttons/icons for targeted calls and conference calls.

Operation
When needed, users can activate the talkback unit by pressing the call button. This action will prompt the control panel to display the device ID and location along with a ringtone. The user can then acknowledge the call, establishing a connection for conversation.

Audio Specifications
The talkback unit's speaker output shall be a minimum of 65 dB, ensuring it is audible to listeners. The microphone should be capable of picking up voice from a distance of up to 1 foot with intelligibility.

Fault Monitoring and Supervision
Each talkback unit is electrically supervised for fault monitoring. The recommended cable for the talkback system shall be fire-resistant, with each core of the cable electrically supervised for open and short circuits.

Connectivity Monitoring
The control panel shall also monitor each talkback speaker unit for connectivity. When a unit experiences defects or connectivity issues, it shall be detected and provide an audio-visual warning.

Power Backup
The talkback system shall include a secondary battery for power backup to ensure an uninterrupted power supply.

Note:

For talkback units exposed to sunlight, the enclosure should be paintable to prevent color fading due to UV rays. Regular repainting will help maintain its appearance. Additionally, talkback units installed outside, especially in refuge areas, must have weatherproof enclosures to ensure durability and reliable operation in outdoor conditions.

What are the locations Talkback speaker unit shall be installed ?

1. Each floor level

2. Each notification zone

3. Each elevator cab

4. Elevator lobbies

5. Elevator machine room (s)

6. Emergency and standby power room (s)

7. Fire pump room (s)

8. Area(s) of refuge

9. Each floor level inside an enclosed exit stair (s)

10. Other room (s) or area (s) as required by the authority having jurisdiction.

4.1b Public Address system

Objective:

The Public Address (PA) System is designed to deliver clear and targeted communication within specific zones or areas of a building, particularly during emergencies. Speakers are strategically positioned to ensure effective communication throughout the facility.

System Components:

1. **Speakers with Beacon**: Equipped with visual and audible alert features.
2. **Voice Announcement Speakers**: Designed for clear and intelligible voice communication.

Master Control:

- **Direct Announcements**: Allows operators to make real-time announcements.
- **Automatic Messages**: Enables pre-recorded messages to be broadcasted to selected locations, floors, or areas as needed.

Voice Alarm:

- **Fire Alarm Activation**: Upon detecting a fire, the system automatically broadcasts a message indicating the fire's location, facilitating a swift response from occupants and rescue teams.

Audio Specifications:

- **Output Level**: Speakers must produce audio levels between 65 dB and 100 dB.
- **Clarity**: Must ensure clear and understandable announcements.

Fault Monitoring and Supervision:

- **Speaker Monitoring**: Each speaker unit is electrically supervised to detect faults such as open or short circuits.
- **Cable Requirements**: Use fire-resistant cables with supervised cores for reliability.

Connectivity Monitoring:

- **Control Panel Monitoring**: The control panel continuously checks the connectivity of each speaker unit.
- **Alert System**: Provides audio-visual warnings if any speaker unit encounters defects or connectivity issues.

Power Backup:

- **Secondary Battery**: The system includes a backup battery to ensure uninterrupted operation during power outages.

Note:

The assembly point speaker must be weather proof to withstand diverse environmental conditions. A horn-type speaker is recommended, with a minimum power rating of 12 watts and an audio output ranging from 90 to 100 dB. In car parking areas, ensure adequate coverage for effective communication throughout the space.

The PA system should be capable of driving all connected speakers simultaneously at full load, with an additional 20% capacity reserved for future expansion.

The power backup must provide a minimum of 30 minutes of operation at full load to ensure uninterrupted performance.

What are the locations Public Address speaker unit shall be installed ?

1. Each floor level
2. Each notification zone
3. Elevator lobbies

4. Area(s) of refuge
5. Each floor level inside an enclosed exit stair (s)
6. Assembly point

4.1c Manual Call Point System

Objective:

Manual call points are crucial devices used to trigger the automatic emergency support system in a building. Strategically placed throughout the facility, these call points enable occupants to initiate emergency responses when a fire is detected. The control panel is configured to activate specific support system devices based on the location of the activated call point, triggering a pre-programmed series of actions to manage the emergency effectively.

Fault Monitoring and Supervision

- **Electrical Supervision**: Each manual call point will be monitored for faults, including open and short circuits.
- **Cable Requirements**: Use fire-resistant cables with supervised cores to ensure reliable fault detection and system integrity.

Connectivity Monitoring

- **Control Panel Oversight**: The control panel continuously monitors the connectivity of each manual call point.
- **Alert System**: Provides audio-visual warnings if any call point encounters defects or connectivity issues.

Power Backup

- **Secondary Battery**: The manual call point system will include a backup battery to maintain operation during power outages, ensuring continuous readiness in emergencies.

Note:

If sunlight directly impacts the location of a manual call point, the enclosure should be paintable. Exposure to UV rays from sunlight can cause the color of the enclosure to fade over time. A paintable enclosure allows for periodic repainting to maintain its appearance and effectiveness.

What are the locations Manual call point shall be installed ?

1. Each floor level
2. Each notification zone
3. Each elevator cab

4. Elevator lobbies
5. Elevator machine room (s)
6. Emergency and standby power room (s)
7. Fire pump room (s)
8. Area(s) of refuge
9. Each floor level inside an enclosed exit stair (s)
10. Other room (s) or area (s) as required by the authority having jurisdiction.

Important points of as per IS 2189 for Manual Call Point :

If manual call points are located on the landings of an enclosed staircase, such points at each level shall be incorporated within the zone that serves the adjacent accommodation on that level.

4.2.3 Size and Number of Zones (Protected with Manual Call Points)

a) In systems containing only manual call points, location of a fire is usually known to the person operating the call point. As it is often difficult to get information in time to the safety personnel, the restriction on the size and number of zones shall also apply to the systems protected with manual call points only.

b) To prevent misleading indication ofthe position ofthe fire, it is advisable that manual call points be indicated in the control equipment separately from the detectors in zones, which are protected, by both detectors and manual call points. It is strongly recommended that the circuits for the detectors and the call points shall be different in case of conventional detection systems.

4.2.4.3 Each loop should not be divided into more than 8 fire zones. Minimum two isolators are required per zone. It is recommended that a pair offault isolator modules be employed for every 20-30 detectors/manual call points.

6.3.8 Siting of Manual Call Points

Manual call points shall be so located that, to give an alarm, no person in the premises has to travel distance of more than 30 m to reach them. When manual call points are also installed external to the building, the travel distance shall be 45 m.

Where necessary, the travel distance may require to be reduced to less than 30 m, for example, where there is difficulty in free access within the risk or in potentially dangerous risks.

Call points shall be fixed at a height of 1.4 m above the surrounding floor level, at easily accessible, well illuminated and conspicuous positions, which are free of obstructions.

Where the call points are not visible from the front as in the case of a long corridor, they shall be surface mounted or semi-recessed in order to present a side profile area of not less than 750 mm'.

Manual call points shall be housed in dust pre of and moisture proof enclosure properly sealed with rubber lining.

Manual call point shall be located preferably near entry to staircases at various levels.

5.Automatic Fire Detection :

Purpose:

The Addressable Automatic Fire Detection and Automated Voice Alarm System is a critical communication infrastructure in multistoried buildings during fire emergencies. It aims to detect fire and smoke, automatically alert occupants to take appropriate actions for their safety and property protection, and facilitate communication between occupants and rescue support staff.

System Overview and Components:

The system consists of main components such as smoke and heat sensors, manual call points, speakers, beacon lights, and the Control Panel. These components are connected using a 2-core cable. The Control Panel is located in the ground floor control room, while strategically positioned speakers and detection devices enable effective fire detection and communication throughout the building.

SMOKE DETECTOR:

A photoelectric smoke detector is a type of smoke detector that utilizes photoelectric sensing technology to detect smoke within a specific area, providing early fire warnings by monitoring smoke particles in the air. Here's a breakdown of its operation:

1. Photoelectric Sensing Principle:

- **Components**: The detector features a light source, typically an LED, and a light sensor (photodetector) within a sensing chamber.

- **Normal Conditions**: Under normal conditions, the light beam does not directly reach the photodetector.
- **Smoke Presence**: When smoke enters the sensing chamber, it scatters or reflects the light beam towards the photodetector.
- **Alarm Trigger**: The photodetector senses the increased amount of scattered or reflected light. When the detected light exceeds a certain threshold, the alarm is activated.

HEAT DETECTOR:

A heat detector is a fire detection device that responds to changes in temperature rather than smoke. It is specifically designed to detect heat within a particular area, making it suitable for environments where traditional smoke detectors might not be effective.

How Spot-Type Heat Detectors Work:

1. **Temperature Sensing:**
   - **Thermal Sensing Element**: Heat detectors use a thermal sensing element to monitor temperature changes in the surrounding environment.
   - **Response Mechanism**: They are configured to react to either a fixed temperature threshold or a rate-of-rise in temperature.
2. **Fixed-Temperature Heat Detectors:**
   - **Activation Point**: These detectors are set to activate when the temperature reaches a pre-determined level, such as 135°F (57°C) or 190°F (88°C).
   - **Trigger Mechanism**: If the ambient temperature reaches or exceeds this set point, the detector triggers an alarm.
3. **Rate-of-Rise Heat Detectors:**
   - **Rapid Temperature Increase**: These detectors are designed to respond to a rapid increase in temperature over a short period.
   - **Measurement**: They monitor the rate of temperature change rather than a fixed temperature level.
   - **Activation**: If the temperature rises too quickly (e.g., 15°F to 20°F per minute), the detector activates the alarm.

Heat detectors are commonly used in environments where smoke detectors might be prone to false alarms, such as kitchens, garages, and industrial settings.

MULTI-SENSOR:

A multi-sensor combines both smoke and thermal sensing technologies in a single device, enhancing fire detection capabilities.

- **Smoke Sensor**: Detects the presence of smoke within the surveillance area. When smoke reaches the predetermined alarm threshold, it triggers an alarm signal to the fire panel for a prompt response.
- **Thermal Sensor**: Monitors the temperature within the same area, detecting sudden increases or abnormal temperature levels.

Note:

Multi-sensors, which incorporate both smoke and thermal sensors, should be used in locations where both smoke and temperature monitoring are necessary. This approach helps optimize the number of devices required for effective fire detection.

6.Addressable Lighting system

An addressable fire emergency lighting system is a sophisticated solution that assigns unique addresses to each emergency light. This allows precise control during emergencies, directing illumination to specific areas. Integrated with other safety devices, it ensures synchronized responses. The system offers efficient monitoring, diagnostics, and maintenance, enhancing overall safety in buildings.

7. Monitoring of Fire Sprinkler System

The floor sprinkler system integrates monitoring mechanisms. At the entry point of each zone along the sprinkler piping, a sprinkler flow switch is commonly installed. Within the sprinkler head, a quartzoid bulb is situated, designed to rupture when the temperature exceeds a specific threshold, thereby initiating water flow. This automatic heat detection process is overseen by the quartzoid bulb, and its activity is identified by the flow switch which incorporates a potential-free contact. This contact can be linked to an addressable monitor module within the fire alarm system, indicating the presence of a fire.

8.Fire Pump House - Monitoring Water Pressure in Hydrant and Sprinkler Firefighting Systems

The primary water pipe of the firefighting system is required to maintain a pressure of 6 to 8 kg/cm. To oversee this pressure at different points along the pipeline, pressure switches are installed for pressure monitoring. These switches are equipped with an addressable monitor module and are linked to the fire alarm system. If the water pressure falls below the designated level, the pressure switch triggers a fault alert, indicating the need for maintenance.

9.Monitoring of Emergency Fire Exit Doors

Every floor is equipped with fire emergency exit points, each fitted with a fire door. In the event of a fire, occupants would use these fire doors to escape. Magnetic switches are affixed to these doors. These magnetic switches include potential-free contacts, which can be connected to the fire alarm system, enabling the recognition of a fire within that specific zone.

10.List of items used for Fire Alarm:

10.1 Talkback Speaker

The objective of the Talkback System is to allow individuals requiring emergency support to use the nearest talkback speaker to communicate directly with ground floor security staff.

10.2 Public Address Speaker with Beacon

The speaker is designed to address occupants during various situations, especially emergencies. In fire emergencies, alerting specific zones and rescue personnel is vital, ensuring targeted communication without disturbing occupants in other zones. Addressable speakers fulfill this role effectively.

The connectivity and health of emergency speakers are crucial, achievable through addressable speakers with self-diagnosing fault monitoring features. Additionally, NBC regulations mandate visual alert indications for hearing-impaired occupants.

Addressable speakers with beacons fulfill all necessary functions. In the absence of such mechanisms, vendors can propose suitable alternative techniques to achieve the objectives.

10.3 Public Address Speaker

The objective of the Public Address Speaker is to broadcast emergency messages to specific locations, zones, or all occupants as needed. Both the Talkback and Public Address Speakers serve dual purposes, facilitating day-to-day communications in addition to emergency alerts.

10.4 Sounder Beacon

The Sounder Beacon is a specialized device designed for visual alarm systems, prioritizing fire safety compliance and user-friendly operation.

10.5 Manual Call Point

Manual call point is an initiating device to trigger an automatic emergency support system. These call points are strategically placed throughout buildings. The control panel can be configured to automatically activate specific devices on the support system depending on the location of the emergency. When occupants detect a fire and activate the nearest call point, the system initiates a series of pre-programmed actions.

10.6 Smoke Detector

A smoke detector is a type of smoke detector that utilizes photoelectric sensing technology to detect smoke within a specific area, providing early fire warnings by monitoring smoke particles in the air.

10.7 Heat Detector

A heat detector is a fire detection device that responds to changes in temperature rather than smoke. It is specifically designed to detect heat within a particular area, making it suitable for environments where traditional smoke detectors might not be effective.

10.8 Multisensor

A multi-sensor combines both smoke and thermal sensing technologies in a single device, enhancing fire detection capabilities.

10.9 Monitor Module

Monitor module is designed to meet the supervisory requirements of fire protection systems. This device utilizes monitoring circuits to examine the contact status of the connected water flow switch/pressure switch, building automation etc.

10.10 Control Module

Control module is a device designed to control electromechanical devices to support evacuation, AHU tripping, deactivation of security access control, to trigger fire fighting system etc.

10.11 Short Circuit Isolator

This device is designed to detect over current/short circuit and isolates the supply to its output. At the time of short circuit, the device will disconnect the supply to the consecutive series of devices connected after isolator module. Short circuit isolators are placed between groups of devices. It minimise the damage due to the short circuits. It deactivates only disturbed circuit devices and other devices are undisturbed to deliver its function.

10.12 Fire Alarm Control Panel

This control panel serves as a centralized unit, providing a wide range of functionalities, as required to meet NBC 2016.

11.Creation and Maintenance of Documentation and Records :

The supplier is responsible for providing comprehensive documentation and records to the users, including:

1. Fire detection and warning system layout drawings.
2. Bill of materials with make and model information for all components.
3. Warranty documents for the supplied products.
4. Device ID, device location, zone ID, and zone location information.
5. Zone ID and targeted speakers with voice alarm messages.
6. Speakers ID and their locations, along with zone descriptions and speakers used in each zone.
7. Monitor module ID and its location used in the fire-fighting system, covering floor-wise sprinkler flow switches, line pressure monitoring pressure switches, fire door monitoring, and fire pump house monitoring contacts.
8. Control module ID and its location used for zone-wise fire damper tripping, security access control deactivation , lift control, etc
9. Backup power Batteries calculation sheets.
10. User manual.

Objective of these comprehensive records ensures that the users can effectively manage and maintain the fire alarm and warning system, making it easier to carry out inspections, troubleshooting, and necessary upgrades in the future.

12.Fire Alarm Checklist

Fire Alarm System Standard Documentation Table and Check List

Bill of Material used for Fire Alarm System

Item No	Item Description	Qty	Remarks
1	Addressable Talkback Speaker	5	
2	Addressable Horn Speaker	4	
3	Addressable Sounder Beacon	15	
4	Addressable Manual Call Point	22	
5	Addressable Multisensor	160	
6	Addressable Monitor Module	4	
7	Addressable Control Module	2	
8	Addressable Short Circuit Isolator	8	
9	Addressable Control Panel	1	
10	Beam Detector	4	
11	Control Panel	1	

Check List for Fire Alarm Zonal details

Fire alarm systems installed in a building shall be divided into zones. List of zone number and zone description table.

ZONE ID	ZONE DISCRIPTION	REMARKS
4	Left Fourth Floor	
12	Basement Store Room	
29	Right Ninth Floor	
32	Right Basement	

Checklist To verify Device ID, device location, Zone No, Zone Location and Its Function

DEV ID	DEV TYPE	DEV LOCATION	ZONE ID	ZONE LOCATION	Remarks
7	MANUAL CALL POINT	DENODO TECHNOLOGIES	6	SIXTH FLOOR CONFERENCE ROOM	
30	PA SPEAKER	ISOROUT BUSINESS CENTER	5	FIFTH FLOOR MEETING HALL	
35	Talkback SPEAKER	STAR INDIA	8	EIGHTH FLOOR DISCUSSION ROOM	
102	SMOKE DETECTOR	LIFT LOBBY	30	GROUND FLOOR LOBBY	

Check List for Sounder/Speaker Configuration

1. Speakers/Sounders are installed for the purpose to alert the occupants who are in danger zone also to alert support staffs who are responsible to support emergency. Hence audio system configuration detail document required to check the system

2. Device ID
3. Device Type
4. Device Location

S.No	Zone No	Zone Description	Remarks
1	11	GROUND FLOOR WAITING AREA	
2	29	NINETH FLOOR ELECTRICAL ROOM	
3	12	BASEMENT STORE ROOM	
4	8	EIGHTH FLOOR DISCUSSION ROOM	

Automatic Activation of Pre-recorded of voice alarm message based on zonal Output device location

S.No	Zone No	Zone Description	Pre-Recorded Voice Alarm Message	Remarks
1	29	Ninth Floor Electrical Room	Attention Please Fire Reported in Ninth Floor Electrical Room	
2	12	Basement Store Room	Attention Please Fire Reported in Basement Store Room	
3	8	Third Floor Discussion Room	Attention Please Fire Reported in Third Floor Discussion Room	
4	11	Second Floor Record Room	Attention Please Fire Reported in Second Floor Record Room	

13.Standard operating Procedures Manual

A. In case of Fire Alarm triggered by manual call point.
B. In case of fire alarm triggered by automatic smoke or heat detector.
C. In case of call triggered from Talkback unit.
D. How to use PA system
E. Daily, weekly , monthly, quarterly , half yearly, yearly maintenance procedures and check list.
F. Trouble shooting manual.
F. Mock drill procedures on zone wise and full building and recall.
G. Evacuation procedures. Zone wise and full building and recall.

14.Site Acceptance Test

Design consultant/ Supplier/ user shall prepare site Acceptance Test procedures to validate entire system and its components .
On completion of installation. Based on site Acceptance procedures user / supplier validate the system. On acceptance , the system shall be handed over to user personnel.

15.Comprehensive Warranty service for system

The supplier shall offers a comprehensive warranty covering the products, system, and services for a period of 2 years from the date of supply. In the event of any damage to the product or system caused by factors not attributed to the supplier's mistakes, the user will be responsible for providing suitable compensation for rectification. On the other hand, if any failure occurs due to mistakes made by the supplier, they shall take full responsibility for the rectification at their own cost.

16.Fire licensing/ NOC from fire Authorities:

1. Designer or supplier shall prepare required drawings and relevant documents , application for pre installation for proposed system to assist to obtain approval to proceed with Fire authorities.

2. Designer or supplier shall prepare as built drawings and relevant documents , application for post installation to assist to obtain Fire license / NOC from Fire authorities.

3. Supplier/ service provider shall train the user operation and maintainance personnel for operation and daily / weekly/ monthly maintenance.

4. Supplier/ service provider along with user personnel shall conduct fire drills on commissioning, quarterly for first two years afterwards every 6 months .

5. Supplier/ service provider shall assist user to timely renewal for obtaining license/ NOC renewal .

6. Supplier / service provider shall assist and accompany user for third party fire safety auditors for auditing the system on completion and every two years. If any non compliance and alterations found and suggested by them shall be incorporated and re offer for audit.

7. In case any untoward incidents of fire resulting damage of property/ life . Supplier or service personnel shall assist user with all documents and records for legal protection of user and to claim of insurance. Hence copy of documents shall be remotely or supplier/ service provider office or user recommended place.

17.Smoke detector Calibration

Periodic calibration of the supplied smoke detectors is essential, following the guidelines specified in IS 2189. As part of the handover process, the necessary calibration service agreement copy with the Original Equipment Manufacturer (OEM) must be provided. This ensures that the smoke detectors remain accurate and reliable, maintaining the system's effectiveness in detecting potential fire incidents.

18.Service support system for Upgrades and Obsolete Management of Devices:

The software used in the system may be built on a third-party software platform, and any revisions or upgrades to this third-party software can impact the functionality of the system's software.

Moreover, the electronic semiconductors used in the devices and systems may become obsolete over time, leading to non-availability of spares, which could result in parts or the entire system going out of service.

To address these concerns, the entire life cycle of the system, or at least up to 5 years from the date of commissioning, should include appropriate obsolete management measures. A copy of the obsolete support service agreement with OEM must be provided during the handover of the system to ensure continuity and proper maintenance of the devices and software throughout their operational lifespan or 4 years from the date of supply.

19.Cabling Configuration

The tree cabling configuration is highly recommended for fire detection and speaker systems. One significant advantage of this setup is the minimal cable usage it requires. The shorter cable lengths lead to reduced power loss. Modern fire detection systems often incorporate numerous loop-powered speakers and high-current devices. To mitigate power and signal loss, it's crucial to keep cable lengths as short as feasible. This reduction in cable length not only minimizes power loss but also lowers the costs associated with cable supply and installation.

20. Estimate and Cost

Design consultant shall prepare tentative budget for entire life cycle of fire detection and warning system.

1. Initial design and documentation till finalization supplier.
2. Cost of the primary materials and its consumables , logistics, storage and procurement process costs.
3. Cost of redesigning and documentation based on finalized makes and models.
4. Cost of cable laying, fixing of devices , equipments .
5. Testing and commissioning expenses.
6. Preparation of as erected drawings, user manual, operation and maintenance procedures etc.
7. Periodical fire drill cost
8. Tentative expenses involved to obtain a license from fire authorities.
9. Preventive maintenance costs using same supplier or third party maintenance service provider cost for first year.

Second year
1. License renewal cost on completion of first year.
2. AMC agency cost for Preventive Maintenance costs including smoke detectors calibration cost .
3. Fire drill and training cost.

Third year

1. License renewal cost on completion of second year.
2. Third party Auditors for auditing the system.
3. AMC agency cost for Preventive Maintenance costs including smoke detectors calibration cost .
4. Fire drill and training cost.

Fourth year:

1. License renewal cost on completion of third year
2. AMC agency cost for Preventive Maintenance costs including smoke detectors calibration cost .
3. Fire drill and training cost.

Fifth year:

1. License renewal cost on completion of fourth year.
2. Third party Auditors for auditing the system.
3. AMC agency cost for Preventive Maintenance costs including smoke detectors calibration cost .
4. Fire drill and training cost.

20.1 Schedule of Price
Make and Model number

Tenderer shall choose the items, which can be supportive for long term.

1.Their role employees are familiar to install, maintain, troubleshoot the system and its devices.

2.Choosing suitable OEM for spares , upgrades , obsolete management, smoke detectors calibration work , training.

3.OEM shall extend the support, in the absence of installer .

S.NO	Device description	Make	Model no.
1	Addressable Manual call point		
2	Addressable Multisensor (smoke + heat)		
3	Addressable monitor module		
4	Addressable control module		
5	Addressable speaker (5 watts) with beacon		
6	Addressable 12 watts speaker		
7	Addressable Talkback speaker		
8	Addressable short circuit isolator		
9	Control panel for Fire detection, voice alarm, public address system, Talkback system, fire escape lighting system.		
10	2×1.5 Sq MM copper cable wherever possible conduit pipe flushed in a wall, for open wiring using Armoured FRLS red Colour cable.		

20.2 Schedule of Price for Supply

S.NO	Device description	Quantity	Unit	Rate	Amount
1	Addressable Manual call point	46			
2	Addressable Multisensor (smoke + heat)	14			
3	Addressable monitor module	46			
4	Addressable control module	8			
5	Addressable speaker (5 watts) with beacon	48			
6	Addressable 12 watts speaker	4			
7	Addressable Talkback speaker	46			
8	Addressable short circuit isolator	6			
9	Control panel for Fire detection, voice alarm, public address system, Talkback system, fire escape lighting system.	1			
10	2×1.5 Sq MM copper cable wherever possible conduit pipe flushed in a wall, for open wiring using Armoured FRLS red Colour cable.	1 lot or 800 metres (see note)			

Notes:

1. Cable quantities may vary based on technology, manufacturer, and wiring scheme. If the cabling requirements increase due to changes in technology or manufacturer, the tenderer shall supply and install the additional cables at no extra cost. If the tenderer can determine the required cable quantity based on the technology and manufacturer, they should quote that quantity. If the cable quantity increases, the tenderer shall supply and install the additional cables at their own cost.

2. The tenderer must select a control panel that can accommodate 20% more than the proposed quantity.

3. The tenderer must choose a suitable SMF battery and power supply tool to meet the current load and an additional 20% load. The battery shall be supplied at the time of commissioning, and its price should be included in the control panel cost. The warranty certificate issued by the supplier shall be handed over to the end user during commissioning.

4. As far as the buyer is concerned, the total amount is considered as one item. The tenderer should consider a 5% variation in quantity of materials and work, as it may vary during installation and due to site conditions. The unit rates provided are for detailed billing purposes. In case of major variations resulting from changes in the building's architecture, these unit rates may be used for additional billing and payment.

20.3 Schedule of Price for Erection

S.NO	Device description	Quantity	Unit	Rate	Amount
1	Addressable Manual call point	46			
2	Addressable Multisensor(smoke + heat)	14			
3	Addressable monitor module	46			
4	Addressable control module	8			
5	Addressable speaker (5 watts) with beacon	48			
6	Addressable 12 watts speaker	4			
7	Addressable Talkback speaker	46			
8	Addressable short circuit isolator	6			
9	Control panel for Fire detection, voice alarm, public address system, Talkback system, fire escape lighting system.	1			
10	2×1.5 Sq MM copper cable wherever possible conduit pipe flushed in a wall, for open wiring using Armoured FRLS red Colour cable.	1 lot or 800 metres (see note)			

Notes:

1. Tenderer shall include the price of consumable like detector/device mounting box , clamps, cable glands, etc as required .
2. Tenderer shall include the price of minor civil work like flush mounting of some of the device back box , wall drilling and patch-up work , etc.

20.4 Schedule of Price for Testing and Commissioning

S.NO	Device description	Quantity	Unit	Rate	Amount
1	Addressable Talkback speaker	46			
2	Public Address speaker with beacon	48			
3	Public Address Speaker	4			
4	Addressable Manual Call Point	46			
5	Addressable Multisensor	14			
6	Addressable Monitor module	46			
7	Addressable control module	8			
8	Addressable short circuit isolator	6			
9	Control panel for Fire detection, voice alarm, public address system, Talkback system, fire escape lighting system.	1			
10	2×1.5 Sq MM copper cable wherever possible conduit pipe flushed in a wall, for open wiring using Armoured FRLS red Colour cable.	1 lot or 800 metres (see note)			

20.5 Schedule of Price for Documentation

S.NO	Device description	Quantity	Unit	Rate	Amount
1	Addressable Manual call point	46			
2	Addressable Multisensor(smoke + heat)	14			
3	Addressable monitor module	46			
4	Addressable control module	8			
5	Addressable speaker (5 watts) with beacon	48			
6	Addressable 12 watts speaker	4			
7	Addressable Talkback speaker	46			
8	Addressable short circuit isolator	6			
9	Control panel for Fire detection, voice alarm, public address system, Talkback system, fire escape lighting system.	1			
10	2×1.5 Sq MM copper cable wherever possible conduit pipe flushed in a wall, for open wiring using Armoured FRLS red Colour cable.	1 lot or 800 metres (see note)			

Notes:

1. Pre-installation layout drawing
2. As built drawing
3. Cable schedule
4. Loop-power calculation sheet
5. Battery and power supply calculation sheet
6. Check-list of individual device validation
7. Device type , Device ID , location description and zone configuration chart.
8. Output device configuration based on input and zonal device .
9. Zonal Voice alarm statement chart.
10. Technical datasheets of all items
11. User installation, validation, maintenance and troubleshooting method of individual items.
12. Detector validation, dust detection and cleaning procedure, calibration schedule and calibration vendor detail.
13. Overall system sequential functional list based on individual device activation.
14. User operation manual
15. User maintenance daily/weekly/monthly/quarterly/yearly manual