SECTION 28 31 11
ADDRESSABLE FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Remote annunciator.
7. Addressable interface devices

1.02 SYSTEM DESCRIPTION

A. Non-coded, addressable system, with multiplexed signal transmission, dedicated to fire-alarm service only.

1.03 PERFORMANCE REQUIREMENTS

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
1. Comply with recommendations of NFPA 72.
2. Include battery-size calculations.
3. Include complete wiring diagrams specific for the project.
4. Include floor plans showing address of each addressable device.

C. Submittals shall be approved by authorities having jurisdiction.

D. Field quality-control reports.

E. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
2. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72:
   a. Frequency of testing and inspection of installed components.
   b. Requirements and recommendations related to results of maintenance.
   c. Manufacturer's user training manuals.
3. Manufacturer's required maintenance related to system warranty requirements.

1.05 QUALITY ASSURANCE

A. Compliance with NFPA- 72 and NFPA- 101.

B. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Fire Control Instruments, Inc.
2. Gamewell
3. Notifier.
4. Siemens Building Technologies, Inc.
5. Simplex/Grinnell.

2.02 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
1. Manual stations.
2. Heat detectors.
3. Smoke detectors.
4. Duct smoke detectors (if required by local AHJ).
5. Automatic sprinkler system water flow.

B. Fire-alarm signal shall initiate the following actions:
1. Continuously operate alarm-notification appliances.
2. Identify alarm at the fire-alarm control unit and remote annunciator.
3. Transmit an alarm signal via a telephone line to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Record events in the system memory.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
2. Duct type smoke detector (if required by local AHJ).

D. System trouble signal initiation shall be by one or more of the following devices and actions:
1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at fire-alarm control unit.
4. Ground or a single break in fire-alarm control unit internal circuits.
5. Abnormal ac voltage at fire-alarm control unit.

6. Break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at fire-alarm control unit or annunciator.

E. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit and remote annunciator.

2.03 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:
1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.

B. Alphanumeric Display and System Controls: Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, 40 characters minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

C. Circuits:
1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class A.

D. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

E. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module.
1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

F. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
1. Batteries: Sealed lead calcium.

G. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame.

2.04 MANUAL FIRE-ALARM STATIONS

A. General Requirements: Comply with UL 38, finished in red, for mounting on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
1. Double-action type, with integral addressable module.
2. Station Reset: Key- or wrench-operated switch.

2.05 SYSTEM SMOKE DETECTORS

A. General Requirements:
1. Photoelectric type, addressable, complying with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be four or two-wire type based on class of initiating device circuit.
3. Integral Visual-Indicating Light: LED type.

4. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.

B. Duct Smoke Detectors: Photoelectric type, addressable, complying with UL 268A.
1. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector.
2. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions.
3. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.06 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.

B. Heat Detector, Combination Type: Addressable type, fixed temperature135 deg F or temperature rate of rise that exceeds 15 deg F per minute.

C. Heat Detector, Fixed-Temperature Type: Addressable type, actuated by temperature that exceeds a fixed temperature of 190 deg F.

2.07 NOTIFICATION APPLIANCES

A. General Requirements for Notification Appliances: Connected to notification appliance signal circuits.
1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.

B. Horns: Electric-vibrating-polarized type, 24-V dc. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn.

C. Visible Notification Appliances: Xenon strobe lights comply with UL 1971, with clear lens and word "FIRE" engraved in minimum 1-inch- high letters.
1. Rated Light Output:
a. 15/30/75/110 cd, selectable in the field.
2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Mounting Faceplate: Factory finished, red or white as required by local AHJ.

2.08 REMOTE ANNUNCIATOR

A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
1. Mounting: Flush cabinet, NEMA 250, Type 1.

B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit.

2.09 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.

PART 3 - EXECUTION

3.01 EQUIPMENT INSTALLATION

A. Comply with NFPA 72 for installation of fire-alarm equipment.

B. Equipment Mounting: Install fire-alarm control unit with tops of cabinets not more than 72 inches above the finished floor.

C. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

D. Alarm-Indicating Devices: Install not less than 6 inches below the ceiling.

E. Device Location-Indicating Lights: Locate in public space near the device they monitor.

F. Annunciator: Install with top of panel not more than 72 inches above the finished floor.

3.02 CONNECTIONS

A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet from the device controlled.
   1. Supervisory connections at valve supervisory switches.

3.03 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

3.04 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.05 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by Architect and authorities having jurisdiction.

B. Tests and Inspections:
   1. Visual Inspection: Conduct visual inspection prior to testing as required by NFPA72.

2. Prepare test and inspection reports. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" and the "Inspection and Testing Form" as required by NFPA 72.

C. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

END OF SECTION 28 31 11