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**SECTION 28 00 00**

**FIRE ALARM SYSTEM**

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**PART 1 - GENERAL**

**1.1 GENERAL REQUIREMENTS**

- A. Contractor shall obtain latest Marriott specifications from Marriott Fire Protection Department prior to preparing design/build documents. Marriott latest version shall take precedence over this version.
- B. Conform to General and Supplementary Conditions, the modifications thereto and Division 1 General Requirements for all work in Division 28.
- C. Comply with Division 26 Sections, as applicable. Refer to other Divisions for coordination of work.

**1.2 SCOPE OF WORK**

- A. Provide design, permits, labor, wiring, raceways, materials and appliances and satisfactory installation of Fire Alarm System ready to operate in accordance with Owner's requirements and in compliance with applicable Codes.
- B. Coordinate Work of this Section with Owner's communication vendors and the Fire Sprinkler Design/Build contractor.
  - 1. Meet jointly with representatives of above organizations and Owner's representatives to exchange information and agree on details of equipment arrangements and installation interfaces.
  - 2. Record agreements reached in meetings and distribute record to other participants.
  - 3. Coordinate use of riser space and backboards with other systems.

**1.3 CODES AND STANDARDS**

- A. If any conflict occurs between legally adopted codes and this specification, the codes are to prevail; this shall not be construed as relieving the Contractor from complying with any requirements of the plans or specifications which may be in excess of code requirements and not contrary to same.
- B. Fire alarm system shall comply with requirements of State and local codes and ordinances, with American with Disabilities Act (ADA), local accessibility codes, with other authorities having jurisdiction, and with NFPA-70, NFPA-72, N.E.C. Article 760, NFPA 90A, NFPA-101. The fire alarm system equipment shall be UL listed for the purpose intended.
- C. Conform to code and agency requirements having jurisdictional authority over installation and as indicated on plans.

#### 1.4 FINAL CONSTRUCTION APPROVAL

- A. Completion and approval of the following is required for final approval of systems.
  - 1. Operation and maintenance instruction.
  - 2. Operation and maintenance manuals submitted.
  - 3. Equipment cleaning.
  - 4. Record drawings submitted.
  - 5. Testing Report submitted.

#### 1.5 DOCUMENTATION

- A. Product Submittals: Within thirty (30) calendar days after contractor's receipt of Owner's Notice to Proceed, submit in PDF format:
  - 1. Organized PDF electronic file that includes relevant catalog data for all electrical equipment, emergency generator and light fixtures in accord with Division 1.
  - 2. Unless otherwise indicated, material and equipment to be submitted includes all items specified in Part 2 (Products) in each section of Division 28 and as listed on equipment schedules on drawings, and/or necessary to complete the work.
  - 3. Clearly indicate on each page the equipment schedule designation, as applicable, and model intended for use.
  - 4. Do no fabrication or manufacture any products until return of approved submittals.
- B. Provide shop drawings for all products, systems, system components, and special supports which are not a standard catalog product and which may be fabricated for the Contractor or by the Contractor. Lay out drawings to scale and show dimensions where accuracy of location is necessary for coordination or communication purposes.
- C. The word "provide" in the drawings and specifications shall be understood to mean "furnish and install complete and operational".
- D. Permits: Submitted for, paid for, and obtained by Contractor. Submit copies of signed, approved permits to the Architect. See Supplementary Conditions.
- E. Record Drawings: See Division 1. Provide two sets of record drawings. Show location and size of equipment.
- F. Operating and Maintenance Manuals: Furnish three (3) copies of operating and maintenance manuals. Manual shall be hard-cover loose-leaf with index and tabbed Sections. Manual shall include the following:
  - 1. Manufacturers, suppliers, and subcontractors' names, address, and phone numbers.
  - 2. Schedule and description of routine maintenance for each component.
  - 3. Written guarantees.
  - 4. Record drawings corrected and completed.
  - 5. Copies of manufacturer's warranties on equipment.
  - 6. Equipment submittals.
- G. Operation Instruction Period: Conducted by Contractor during minimum eight (8) hour period. Deliver and post all operation and maintenance instructions at this time.

**1.6 ELECTRICAL**

- A. Power Wiring: By Electrical Contractor.
- B. Low Voltage Wiring: By Division 28. If line voltage control wiring is required that is not shown on plans, Fire Alarm contractor shall provide an allowance for same.
- C. Owner will not entertain additional cost requests due to lack of coordination between Division 28 and Electrical Contractor.

**1.7 WARRANTY**

- A. Warrant materials and workmanship for one year in accord with the General and Supplementary Conditions. Provide written guarantees which exceed one year. Submit with Maintenance and Operating Manual. Warranty period to extend from date of substantial completion.

**1.8 EMERGENCY SERVICE**

- A. The subcontractor shall provide a twenty-four (24) hour emergency telephone number for all warranty work related to their contract. The subcontractor shall complete all emergency service work with the same day of notice.

**1.9 CUTTING AND PATCHING**

- A. Provide all cutting and patching necessary to install work not otherwise coordinated with other trades prior to installation. Patching shall match adjacent surfaces.

**PART 2 - PRODUCTS****2.1 FIRE ALARM SYSTEM**

- A. Provide noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- B. Automatic sensitivity control of certain smoke detectors.
- C. All components provided shall be listed for use with the selected system.
- D. 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.
  - 1. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
    - a. Manual stations.
    - b. Heat detectors.
    - c. Smoke detectors.
    - d. Duct smoke detectors.
    - e. Carbon monoxide detectors

- f. Automatic sprinkler system water flow.
- g. Fire-extinguishing system operation.
- h. Fire standpipe system;
- 2. Fire-alarm signal shall initiate the following actions:
  - a. Continuously operate alarm notification appliances.
  - b. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
  - c. Transmit an alarm signal to the remote alarm receiving station.
  - d. Unlock electric door locks in designated egress paths.
  - e. Release fire and smoke doors held open by magnetic door holders.
  - f. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
  - g. Close fire/smoke dampers in air ducts of designated air-conditioning duct systems.
  - h. Recall elevators to primary or alternate recall floors.
  - i. Activate elevator power shunt trip.
  - j. Activate emergency lighting control.
  - k. Activate emergency shutoffs for gas and fuel supplies.
  - l. Record events in the system memory.
  - m. Other actions as required by Fire Marshall.
- 3. Supervisory signal initiation shall be by one or more of the following devices and actions:
  - a. Valve supervisory switch.
  - b. Elevator shunt-trip supervision.
  - c. Loss of communication with any panel on the network.
  - d. Other devices and actions as required by Fire Marshall.
- 4. System trouble signal initiation shall be by one or more of the following devices and actions:
  - a. Open circuits, shorts, and grounds in designated circuits.
  - b. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
  - c. Loss of communication with any addressable sensor, input module, relay, control module, or remote annunciator.
  - d. Loss of primary power at fire-alarm control unit.
  - e. Ground or a single break in internal circuits of fire-alarm control unit.
  - f. Abnormal AC voltage at fire-alarm control unit.
  - g. Break in standby battery circuitry.
  - h. Failure of battery charging.
  - i. Abnormal position of any switch at fire-alarm control unit or annunciator.
- 5. System Supervisory Signal Actions:
  - a. Initiate notification appliances.
  - b. Identify specific device initiating the event at fire-alarm control unit and remote annunciators.
  - c. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.
- 6. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

- a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

## **2.2 SYSTEM CONTROL PANEL FEATURES**

- A. General Requirements for Fire-Alarm Control Unit:
  - 1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
  - 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
  - 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
- B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

## **2.3 EXTERNAL DEVICES**

- A. The system shall utilize UL listed and FM approved fire alarm initiating devices (i.e., pull stations, smoke detectors, heat detectors, water flow switches when applicable to project, duct detectors, etc.) as shown on the drawings.

## **2.4 IDENTIFICATION PRODUCTS**

- A. Comply with the following:
  - 1. Cable Labels: Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed with alphanumeric cable designations.

# **PART 3 - EXECUTION**

## **3.1 EQUIPMENT INSTALLATION**

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

## **3.2 PATHWAYS**

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
- B. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.

- C. Pathways shall be installed in EMT.
- D. Exposed EMT shall be painted red enamel.

**3.3 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.

**3.4 FIELD QUALITY CONTROL**

- A. Provide field tests as required system manufacturer and by authorities having jurisdiction.

**3.5 DEMONSTRATION**

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

**END OF SECTION**