

SECTION 283113.13

ALTERATIONS AND ADDITIONS TO EXISTING FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and General Provisions of Contract including General and Supplementary Conditions and other Division 1 Specifications apply.

1.2 RELATED SPECIFICATION SECTIONS: [To be edited per job]

- Section 260510..... General Work for Electrical
- Section 260533..... Raceways and Boxes

1.3 DESCRIPTION OF WORK:

- A. This section covers the furnishing, installation and testing of a complete Alterations and Additions to existing Fire Alarm System which includes actuation devices, notification appliances, and actuation devices which cause other Code or operations functions to occur, such as air handling unit shut down and fire door/shutter operations.
- B. Contractor to verify alarm system manufacturer and type.
- C. This section requires all conduit and wiring to support complete Fire Alarm System. Drawings do not show conduit and wiring requirements. This information is to be supplied to Contractor by Fire Alarm Supplier, both prior to bids for inclusion in pricing and specifically in Shop Drawing.
- D. Contractor is required to review all Contract Documents for connections of other systems to Fire Alarm for Code required operations. Items such as held-open fire/smoke doors, smoke/fire dampers, elevator recall, hood suppression system, smoke evacuation fans, etc. are a part of the fire alarm system.

1.4 SYSTEM OPERATION:

- A. System non-coded, general alarm.
- B. Electrically supervise system against both short and open wiring faults in detection circuits, alarm circuits, and internal control panel faults. Short or open wiring faults occurring in circuits will cause audible and visual trouble indication at control panel.
- C. System functions as follows when an actuation device is initiated:
 - 1. Audible alarm devices will sound continuously. Visual alarm devices will flash.
 - 2. Proper zone and fire indications will appear on main control panel and remote annunciators.
 - 3. Circuits to energize or de-energize equipment power control circuits will be actuated as indicated. Shut down HVAC Equipment.
 - 4. Circuits to electrically held smoke and fire doors will release doors.
 - 5. Digital communicator will notify the monitoring service if connected.
 - 6. Closing of sprinkler valve will cause audible and visual signal at Annunciator(s), but will

not initiate Fire Alarm.

7. Actuation of sprinkler flow valve will initiate system.

1.5 MANUFACTURER'S REQUIREMENTS:

- A. System shall be supplied, installation supervised and tested by an Authorized Factory Dealer located within seventy (70) miles of project site. Submit evidence of same with Shop Drawings.
- B. Submit complete Shop Drawings of system for review including terminal-to-terminal connection diagram, conduit diagrams, technical information on each item of equipment, and any other information required to describe system. Identify color code and terminal numbers on Shop Drawings.
- C. Manufacturer's trained Technical Representative shall supervise installation, connections, and test. Before acceptance, Manufacturer's Representative will certify in writing system is installed and functioning properly as intended by Drawings, Specifications, and Code. Test include operation of all devices.
- D. Guarantee system in writing for one (1) year from date of acceptance. Guarantee covers parts and labor.

1.6 CODES:

- A. The Fire Alarm Systems shall comply with requirements of NFPA Standard No. 72 and NFPA 70, Article 760 for protected premises signaling systems, except as modified and supplemented by this Specification. The system shall be supervised either electrically, or by software-directed polling of field devices.
- B. The system shall also be listed by Underwriter's Laboratories under the category Control Unit System (UOJZ) and Control Unit Accessories (UOXX).
- C. The Fire Alarm System shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001 and ANSI/ASQC Q9001-1994.
- D. System shall comply with all local Codes. Modification of design to meet same is required and no additional compensation will be allowed for compliance. See execution section for devices to assist in this.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Entire system shall be the product of _____, no exception.
- B. Specifications list product numbers.

2.2 SYSTEMS:

- A. System shall consist of modifications and additions to main control panel complete with increased batteries and charger to support system operation and all required components required by system expansion and factory installed surge suppression on power input.
- B. System Components:

1. Existing System Control Panel:
 - a Communication module for remote monitoring and built-in surge suppressor on power feed.
2. Main Control Panels:
 - a Mount all new devices in existing enclosure to prewired existing panel to terminal strips or to additions in new metal enclosure with prewired terminal strips..
 - b Construct cabinets of 14 gage steel with baked paint finish.
 - c Identify all devices, relays, circuit cards, etc., as to function with permanent identification.
 - d Furnish function modules as follows:
 - (1) [Zone Modules: Class "B" power limited; 24 volt DC, for N.O. initiating devices; two (2) initiating circuits per module; (to power detectors from initiating circuit); annunciated alarm and trouble indication; lamp (LED) test; SPDT alarm operated contact; SPDT trouble operated contact. Furnish modules for total zones (zones as shown on drawings) plus seven (7) spare zones.]
 - (2) System Trouble Module: Parallel 24 volts DC; open and short supervision; visual trouble indication. Furnish signal modules as required to power all signal devices shown. Provide trouble audible silence switch with trouble resound.
 - (3) March Time Module: 120 beats per minute to flash visual alarm devices.
 - (4) [Upgrade Signal Circuit Module: Class B operation, to power electrically new and existing supervised signals, 24 volts, provide alarm silence switch with trouble resound, provide separate circuitry for horns and lights.]
 - (5) Rooftop unit shutdown with auxiliary contact in detector.
 - (6) Battery Charger / Transfer Module: Dual rate charger, automatic trickle charge, manual high rate charge; D.C. voltmeter and ammeter; low battery alarm, "on-battery" "indication" automatic transfer switch to supply fire alarm system from battery on failure of incoming 120 volt AC power.
 - (7) Batteries: Sealed, rechargeable, gelled electrolyte, 30 ampere hours based on 20 hour discharge rate, "Gel-cell" or equal. Mount in control panel cabinet.
3. Initiation Modules:
 - a Manual pull station, [addressable], double action, break glass; Simplex, ![Surface Box] ![Protective Shield with surface mount adapter].
 - b Heat detectors, [addressable] rate of rise for normal temperature application 135⁰

fixed with 15⁰ rate of rise.

- c Heat detectors, [addressable] rate of rise high temperature application 155⁰ fixed with 15⁰ rate of rise.
- d Smoke detector, photo-electric [addressable]. [Use detector suitable for area where applied outdoors].
- e Duct detector, photo-electric, with sampling tubes, housing, and remote status/test station with progressible relay for air handling unit shut down.
 - (1) Appropriate length sampling tubes.
 - (2) For air conditioning units 2000 CFM and larger or where shown.
 - (3) [Monitor module, addressable, to monitor devices internal to Fire Alarm such as hood fire suppression panel, fire pump operation, generator running, etc.
 - (4) [Control module, addressable, to operate (turn ON or OFF) external devices such as trip elevator breaker, etc.
- f Flame Detectors:
 - (1) Responds to infra-red radiation, plug-in, adjustable sensitivity and time delay; surface or flush mounted as shown [with addressable monitor module].
- g Sprinkler Flow Switch:
 - (1) Connection only to switch installed by others.
- h Where Manufacturer model numbers are not mentioned, use standard published device (modified as required by Specification) of Notifier complying with Specifications of item described.

2.3 ALARM INDICATING DEVICES:

A. Strobe Alarm Lights:

- 1. White lens mounted in faceplate (to meet ADA requirements), rated 24 VDC; 15 candela minimum lamps; electrically supervised, identified with lettering "FIRE" on unit.

B. Strobe Light/Horn:

- 1. 15 candela minimum power lamp horn; 87 dba at 10 feet; in one faceplate.

C. Strobe Light/High Output Horn:

- 1. 15 candela minimum power lamp horn

D. Where Manufacturer's model is not indicated for alarm devices, use system Manufacturer's standard published device which complies with Specification.

2.4 MISCELLANEOUS DEVICES:

A. Sprinkler Valve Supervisory Switch/Valve Supervisory Switches:

1. Shall be provided and wired by the Electrical Contractor under this section. Valve switches shall be suitable for the application O, S & Y, or PTV Type and shall mount to the valve.
- B. Electric Door Releases:
 1. 24 volt DC connection only to door hardware furnished by others.
- C. Electric Door Holders:
 1. 24 volt DC door and wall device.
- D. ![Knox Box: 4400 with wiring for monitoring circuit.]

PART 3 - EXECUTION

3.1 COMPLETE SYSTEM REQUIREMENTS:

- A. Review entire control documents for items requiring connection to or operation by the fire alarm system to meet and comply with all local and national codes. This includes Architectural, HVAC, Plumbing, and Fire Protection.

3.2 SUBMITTALS:

- A. After review of documents prepare shop drawings as described. Including items not shown on drawings.
- B. Submit shop drawings to local building authorities for their review and approval. Incorporate review comments prior to submission to engineer for review.
- C. Submit Shop Drawings consisting of, but not necessarily limited to, the following:
 1. 1/8 inch scale floor plans showing all devices; the required type and number of conductors with conduit size.
 2. Plans shall specifically cover:
 - a. Initiation of system by manual pull stations and and automatic functions such as smoke detectors, heat detectors, flame detectors.
 - b. Initiation of system by kitchen hood fire protection system(s).
 - c. Initiation of system by elevator smoke and heat detectors and elevator recall and power shut down.
 - d. Initiation of systems by sprinkler system flow valves and trouble signal by sprinkler system supervisory switch.
 - e. Monitoring of:
 - ◆ Fire pump
 - ◆ Emergency generator
 - ◆ [Kitchen refrigeration system]

- f. Release of smoke doors hold-open.
 - g. Unlocking of electrically controlled exit and internal egress doors.
 - h. Each visual device shall be furnished with candela requirements for application with candela power shown by device.
 - i. Each audible device shall be furnished with Db rating required for application with Db rating shown by device.
3. Where review of all contract documents and/or local Codes require devices not shown, use devices listed in Attic Stock to supplement drawings. If Attic Stock is exceeded, notify Architect in Shop Drawing submittal.
 4. Elevation of "Fire Alarm Control Panel" (central control station), and each transponder with location of each component and Manufacturer's descriptive cutsheet of that component. Provide wiring diagrams of control panel.
 5. Power / Battery Calculations.
 6. Submit shop drawing to local Code Official for review and approval prior to submission to Engineer for review.
 7. Shop drawings shall bear approval of authority or some other verification method to sustain review.
 8. Shop drawing shall also bear stamp of review by Electrical Contractor.
 9. Manufacturer's descriptive cutsheet of each initiation device, audible or visual signal and outlet box requirements for mounting. Provide symbol on cutsheet matching that shown on drawing for that device.

3.3 GENERAL REQUIREMENTS:

- A. Furnish and install conduit, outlet boxes, back boxes, junction boxes, terminal cabinets, accessories, wiring connections, etc., required for a complete system as intended by these Specifications, and in accordance with the Manufacturer's recommendation for the equipment supplied.
- B. The conduit and wiring requirements shall be furnished by the Manufacturer's Representative, and he shall, prior to bidding. Inform all Contractors of requirements which shall be included in the bid for this system.
- C. All Fire Alarm wiring shall be put in plenum type cable above accessible ceilings and in exposed ceiling areas. Where ceilings are not accessible, run wiring in conduit. Wall mounted devices shall be installed on outlet box with wiring in conduit, concealed in wall, and stubbed into ceiling.
- D. All Fire Alarm conductors shall be #14 AWG minimum with type "XHHW", "THWN", or "THHN" insulation. Conductors shall be color coded in an approved manner. Each conductor shall be identified with T&B "E-Z" code markers at each device connection, each splice location, each junction box and terminal cabinet, and in the main control panel and remote annunciator.
- E. Multiplex system wiring for Communication channels (2):

1. Two (2) 2/C #18 twisted shield cable; Belden #8760, or as recommended by Manufacturer.

- F. Provide Fire Alarm System junction boxes ("FJ") as indicated. Junction boxes shall have painted red enamel covers with "FA" on small covers "FIRE ALARM" on large covers in 1 inch high white letters. Splices in junction boxes made on identified terminal strips.

- G. Provide terminal cabinets ("FT") where indicated, size as required, complete with identified terminal strips, quantity as required for number of wires entering cabinet. The cabinets shall be flush or surface mounted as indicated with full height piano hinged door with cylinder lock, keyed same as control panel. Finish shall be white enamel inside with red enamel outside. Install engraved plastic nameplate on cabinet door to identify cabinet as indicated in 1/4 inch high red letters on white background. Attach nameplate with two (2) small screws.

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