SECTION 16703 – ADDRESSABLE 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:

Section 15100……HVAC
Section 15200……Plumbing
Section 15300……Hold-Open Doors
Section 15320……Fire Pump
Section 15325……Fire Protection
Section 15375……Standpipe
Section 15400……Fire Shutters
Section 16010……Shop Drawings
Section 16110……Raceways
Section 16130……Outlet Boxes
Section 16134……Panelboards

1.3 DESCRIPTION OF WORK:

A. This section covers the furnishing, installation and testing of a complete Addressable 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. 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.

C. Contractor is required to review as 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.

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. Elevator recall; Shunt trip elevator power; Shut down HVAC Equipment.

4. Circuits to electrically held smoke and fire doors will release doors.

5. Digital communicator will notify a U.L. listed central system if connected.

6. Closing of sprinkler valve will cause audible and visual signal at Supervised Location, 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 includes 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 one (1) Manufacturer.

B. Specifications list product numbers for Simplex; equal products of Notifier, Edwards, Cerberus, or approved equal are acceptable.

2.2 ADDRESSABLE SYSTEMS:

A. System shall consist of main control panel complete with batteries and charger to support system operation and all required components and factory installed surge suppression on power input.

B. System Capacity:

1. 250 addressable alarm or alarm or IDNET points

2. 4 standard appliance circuit

3. Walk test

4. Panel programming

5. Sensor maintenance alert

6. Ground Fault assistance

C. System Components:

1. System Control Panel:

a. Simplex 4010 True Alarm digital communication module for remote monitoring with built-in surge suppressor on power feed.

2. Remote Annunciator:

a. Simplex 4606-9101.

3. Initiation Modules:

a. Manual pull station, addressable, double-action break-glass; Simplex 4099-9002; surface box, Simplex 2975-9178.

b. Heat detectors, addressable; rate of rise for normal temperature application 135° fixed with 15° rate-of-rise; Simplex 4098-9733 sensor and 4098-9792 base.

c. Heat detectors, addressable; rate of rise high temperature application 155° fixed with 15° rate-of-rise; Simplex 4098-9733 sensor and 4098-9792 base.

d. Smoke detectors, photoelectric addressable; Simplex sensor 4098-9714 with 4098-9792 base. Use detector suitable for area where applied outdoors.

e. Duct detector, photo-electric, addressable with sampling tubes, housing, and remote status/test station with progressible relay for air handling unit shut down.

(1) Simplex 4098-9756 with 2098-9806 and appropriate length sampling tubes.

(2) For air conditioning units 2000 CFM and larger.

f. Monitor module, addressable, to monitor devices internal to Fire Alarm such as hood fire suppression panel, fire pump operation, generator running, etc.

(1) Simplex 4090-9001 in enclosure.

g. Control module, addressable, to operate (turn ON or OFF) external devices such as trip elevator breaker, etc.

(1) Simplex 4090-9002.

4. Sprinkler Flow Switch:

a. Connection only to switch installed by others; Simplex addressable monitor module 4090-9001.

5. Where Manufacturer model numbers are not mentioned, use standard published device (modified as required by Specification) of Simplex 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; 75 candela minimum lamps; electrically supervised, identified with lettering “FIRE” on unit; Simplex 4904.

B. Strobe Light/Horn:

1. 75 candela minimum power lamp horn; 80 dba at 10 feet; in one faceplate; Simplex 4903-9417.

C. Strobe Light/High Output Horn:

1. 75-candela minimum power lamp horn.

D. Speaker/Alarm Lights:

1. 75 candela minimum light, speaker; to be a minimum 90 Db at 10 feet Simplex 4903-9356.

E. Addressable Speaker:

1. Simplex 4902-9716.

F. Where Manufacturer’s model is not indicated for alarm devices, use system Manufacturer’s standard published device that 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; Simplex 4090-9001.

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. Items requiring connection to fire alarm are the responsibility of this section whether shown on electrical documents or not.

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 automatic functions such as smoke detectors, heat detectors, flame detectors.

b. Initiation of system by elevator smoke and heat detectors and elevator recall and power shut down.

c. Initiation of systems by sprinkler system flow valves and trouble signal by sprinkler system supervisory switch.

d. Monitoring of:

- Fire Pump
- Emergency Generator

e. Each visual device shall be furnished with candela requirements for application with candela power shown by device.

f. 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. If local authorities will not 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 ATTIC STOCK:

A. Furnish as a part of the Fire Alarm System the following additional components. Components are for the purpose of providing:

1. Spares for Owner;

2. Supplementary devices to meet ambiguous Code requirements.

3. Modifications after Bids.

B. Requirement is to furnish device installed and connected to system and programmed to function with 30 feet of wire and conduit for connection to circuit.

1. Pull Station Quantity

2. Ceiling-Mounted Smoke Detectors Quantity

3. Duct Detector Quantity

4. Wall-Mounted Strobe/Horn Quantity

5. Wall-Mounted Strobe/Speaker Quantity

6. Ceiling-Mounted Speaker Quantity

7. Monitor Module Quantity

C. Note: Quantity is approximately 5% of total number of devices.

3.4 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 ¼ inch high red letters on white background. Attach nameplate with two (2) small screws.

3.5 RECORD DRAWINGS:

A. The Contractor shall provide “Record Shop Drawings” at the completion of the job. The Electrical Contractor shall keep an accurate set of blue line prints on the job on which all changes from the Contract Drawings shall be indicated in red pencil on a day-to-day basis. At the completion of work, one (1) complete set of blue line prints will be furnished the Contractor by the Multiplex System Supplier for indication in red pencil the changes made in the actual installation. The actual location of all conduit systems, outlets, and equipment installed by this Contractor shall be indicated so as to enable the Owner to properly operate, maintain and repair both exposed and concealed work. These prints shall be turned over to the Architect at the Final Inspection. The work will be checked by the Architect’s or Engineer’s Representative using the “Record Shop Drawings”.

B. Contractor shall, at his expense, have corrections on “Record Shop Drawings” made to the original contract Shop Drawings by an approved professional draftsman. These “correct Shop Drawings” shall be turned over to the Architect.

C. Electrical Contractor shall furnish to the Architect three (3) bound sets of data, including approved corrected record Shop Drawings and Manufacturer’s complete operation and maintenance instructions for all equipment.

3.6 TESTING:

A. Complete system shall be tested in accordance with NFPA 72 to the Architect’s satisfaction. The tests shall include, but not be limited to, an operational test of each initiating and indicating device in the system, and verification of each device alarm zone. Manufacturer’s trained Technical Representative shall supervise installation, connections and test. Before acceptance, Manufacturer’s Representative will test and certify in writing that system is installed and functioning properly as intended by Drawings and Specifications. Test for photoelectric detectors to include sensitivity check with instrument and proper adjustment and/or replacement of defective detectors. Provide log of all test results. Furnish log on test showing each device tested.

B. Furnish eight (8) hours of instruction, to designated Owner’s Representative, on field programming.

C. Guarantee entire system in writing for one (1) year from date of acceptance by Owner. Guarantee will cover completely all components, equipment, wiring, etc. Repair any defects found in the system within the guarantee period without cost to Owner.

END OF SECTION 16703