SECTION 16721 – FIRE ALARM AND SMOKE DETECTION SYSTEMS

PART 1 GENERAL

1.1_ REFERENCES:

NFPA 72 Standard for the Installation, Maintenance, and Use of Protective Signaling Systems

NFPA 72E Standard on Automatic Fire Detectors

NFPA 72G Guide for the Installation, Maintenance and Use of Notification Appliances for Protective Signaling Systems

NFPA 72H Guide for Testing Procedures for Local, Auxiliary, Remote Station and Proprietary Protective Signaling Systems

NFPA 90A Standard for the Installation of Air Conditioning and Ventilating Systems

1.2 QUALIFICATIONS OF INSTALLER: Individual with three or more years recent experience in the installation of smoke detection and fire alarm systems.

1.3 SUBMITTALS:

1.3.1 Make submittals under provisions of this section.

1.3.2 Submittals are required for:

a. Fire alarm and smoke detection system

b. Manufacturer's statement of compliance

c. Authorized distributor and service facility

d. Manufacturer's certification

e. Operating and maintenance manual

1.3.3 Provide product data sheets which show equipment ratings, features, dimensions, and finishes.

1.3.4 Provide shop drawings which show system layout and device interconnections.

1.3.5 Provide battery calculation showing that battery has the capacity to operate system in standby and in alarm modes for times specified.

1.3.6 Submit manufacturer's statement of compliance that integrated system meets or exceeds specified requirements and code requirements.

1.3.7 Submit name, address and telephone number of authorized distributor and service facility.

1.4 EXTRA MATERIALS: Provide three keys of each type.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

a. Edwards

b. Notifier

c. Simplex

d. Thorn

2.2 SUPPLIER: Authorized distributor of manufacturer with service facilities within 100 miles of project site.

2.3 SYSTEM DESCRIPTION:

2.3.1 Fire Alarm System: NFPA 72; automatic intelligent addressable fire alarm system. Integrated system shall be UL listed.

2.3.2 System Supervision: Provide electrically-supervised system, with supervised alarm initiating and alarm signaling circuits. Occurrence of single ground or open condition in initiating or signaling circuit places circuit in TROUBLE mode. Component or power supply failure places system in TROUBLE mode.

2.3.3 Trouble Sequence of Operation: System trouble, including grounding or open circuit of supervised circuits, or power or system failure causes system to enter TROUBLE mode, which includes the following operations:

a. Visual and audible trouble alarm at control panel.

b. Manual ACKNOWLEDGE function at control panel silences audible trouble alarm; visual alarm is displayed until initiating trouble is cleared.

c. Transmit trouble signal to remote station.

2.3.4 Alarm Sequence of Operation: Actuation of manual fire alarm station or automatic initiating device causes system to enter ALARM, which includes the following operations:

a. Sound and display local fire alarm signaling devices with non-coded signal.

b. Transmit non-coded signal to remote station equipment.

c. Indicate location of alarm on fire alarm control panel and on remote annunciator panel.

d. Transmit signal to building mechanical systems to initiate shutdown of fans and damper operation.

1. Transmit signal to elevator for elevator return.

2. Transmit signal to elevator equipment shutoff only upon activation of heat detectors in elevator room or in elevator shaft.

2.3.5 Drill Sequence of Operation: Manual DRILL function causes ALARM mode operation to:

a. Sound and display local fire alarm signaling devices.

b. Indicate location of alarm on fire alarm control panel and on remote annunciator panel.

2.3.6 Alarm Reset: Key-accessible RESET function resets alarm system out of ALARM if alarm initiating circuits have cleared.

2.4 FIRE ALARM CONTROL PANEL:

2.4.1 Control Panel: Modular construction. System shall include provisions for detecting and reporting failures of microprocessor circuits, memory, or software.

2.4.2 Power Supply: Shall be adequate to power all fire alarm system devices including control panel modules, remote detectors, remote annunciators, door holders, relays, and alarm signaling devices. Include battery-operated emergency power supply with capacity for operating system in standby mode for 24 hours followed by alarm mode for 5 minutes.

2.4.3 Provide TROUBLE ACKNOWLEDGE, DRILL, and ALARM SILENCE switches.

2.4.4 Annunciator: Provide supervised annunciator including audible and visual indication of fire alarm by zone and audible and visual indication of system trouble.

2.5 INITIATING DEVICES: Each intelligent device shall have its own address. Information stored in the address shall include device type (smoke sensor, pull station, etc.), and the room number of the space in which it is located.

2.5.1 Manual Station: Semi-recessed mounted, double action manual station.

2.5.2 Ceiling Mounted Smoke Detector: NFPA 72E; photoelectric type, 900 square foot coverage minimum, plug-in base, visual indication that detector is operational, suitable for mounting on 4 inch outlet box.

2.5.3 Heat Detector: NFPA 72 E; fixed temperature type with nominal rating of 135 degrees F, 900 square foot coverage minimum, plug-in base, replaceable and interchangeable fusible element, suitable for mounting on a 4-inch outlet box.

2.5.4 Duct Type Smoke Detector: NFPA 72E, photoelectric type, visual indication that detector is operational, suitable for mounting on ducts provided under Division 15. Provide remote indicator with detector. Remote indicator shall have alarm LED and key test switch. Detector is furnished by Division 16, installed by Division 15, and wired by Division 16. Remote indicator is furnished, installed and wired by Division 16.

2.6 SIGNALING DEVICES:

2.6.1 Alarm Horn: NFPA 72G; surface type fire alarm horn. Sound Rating: 90 dB at 10 feet. Provide integral strobe lamp and flasher with red lettered FIRE on white lens to meet ADA requirements.

2.6.2 Strobe Flasher: NFPA 72G; surface type fire alarm strobe flasher with red lettered FIRE on white lens to meet ADA requirements.

2.6.3 Remote Annunciator: Provide supervised remote annunciator including audible and visual indication of fire alarm by zone, and audible and visual indication of system trouble. Install in flush wall-mounted enclosure.

2.7 FIRE ALARM WIRE AND CABLE:

2.7.1 Fire Alarm Power Branch Circuits: Building wire in conduit as specified in electrical drawings.

2.7.2 Initiating and Signal Circuits: Building wire in conduit as specified in electrical drawings.

PART 3 EXECUTION

3.1 INSTALLATION:

3.1.1 Install system in accordance with NFPA 72 and manufacturer's instructions. All fire alarm system devices and circuits shall be powered and supervised by the Fire Alarm Control Panel.

3.1.2 Install manual station with operating handle 48 inches above floor. Install audible and visual signal devices 12 inches below ceiling but no higher than 80 inches above finished floor, or as shown on drawings.

3.1.3 Use #16 AWG minimum size conductors for fire alarm detection and signal circuit conductors. Install wiring in conduit.

3.1.3.1 Install fire alarm circuit conductors with color coded insulation, or use color coded tape at each conductor termination and in each junction box as follows:

a. Power Branch Circuit Conductors: Black, red, white

b. Initiating Device Circuit: Black, red

c. Signal Device Circuit: Blue (positive), white (negative)

3.1.4 Initiation Device Installation: Initiation devices (i.e. manual stations, smoke detectors and heat detectors) shall be connected in a manner that ensures electrical supervision to the device. Smoke detector bases shall be connected into the circuit in a way which assures that removal of the detector head will cause the circuit to open.

3.1.4.1 Automatic Detector Installation: NFPA 72E and NFPA 90A. Adjust detector locations to avoid conflicts with light fixtures, diffusers, etc. and to comply with NFPA and state requirements.

a. Ceiling mounted detectors shall not be located in a direct air flow or closer than 3 feet from an air supply diffuser.

2. Coordinate and adjust heat detector's operating element to respond prior to activation of sprinkler head in elevator machine room and shaft.

3.1.4.2 Install remote indicator for duct type smoke detector in readily accessible location near associated detector. (See NFPA 70 for definition of readily accessible. Ceilings not higher than 10 feet in finished spaces will be considered readily accessible).

3.2 FIELD QUALITY CONTROL: Test each device and test integrated system in accordance with NFPA 72H and local fire department requirements. These tests shall be conducted by a technician certified by the manufacturer.

3.3 MANUFACTURER'S FIELD SERVICES:

3.3.1 Provide manufacturer's field services to include services of a technician certified by the manufacturer to supervise installation, adjustments, and final connections, and to conduct system and device testing as required in paragraph 3.2.

3.3.2 Provide manufacturer's certification that the installed system has been fully tested as specified, meets or exceeds specifications and code requirements, and is operating properly.

3.4 OPERATING AND MAINTENANCE MANUAL:

3.4.1 Provide two (2) bound operating and maintenance manuals at project completion. Manuals shall contain:

a. Name, address, and telephone number of authorized distributor and service facility

b. Shop drawings

c. Product data

d. Operating and maintenance instructions

e. Manufacturer's warranties

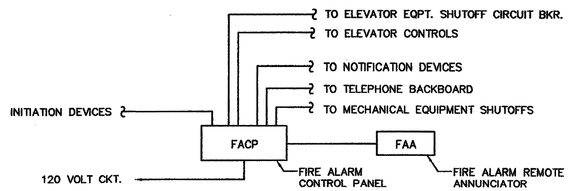
f. Manufacturer's certifications

g. As-built record drawings (show end of line devices)

END OF SECTION

FIRE ALARM LEGEND

FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM REMOTE ANNUNCIATOR
F	FIRE ALARM HORN WITH STROBE FLASHER
F	FIRE ALARM STROBE FLASHER
F	FIRE ALARM MANUAL PULL STATION
S	FIRE ALARM SMOKE DETECTOR
H	FIRE ALARM HEAT DETECTOR
D	FIRE ALARM DUCT SMOKE DETECTOR
T	FIRE ALARM TAMPER SWITCH FOR SPRINKLER, PROVIDED AS A PART OF SPRINKLER SYSTEM, (WIRED UNDER DIVISION 16)
F	FIRE ALARM FLOW SWITCH FOR SPRINKLER, PROVIDED AS A PART OF SPRINKLER SYSTEM, (WIRED UNDER DIVISION 16)
P	FIRE ALARM PRESSURE SWITCH FOR SPRINKLER, PROVIDED AS A PART OF SPRINKLER SYSTEM, (WIRED UNDER DIVISION 16)



FIRE ALARM RISER

SCALE: NONE

NOTES:

1. SEE FLOOR PLANS FOR NUMBER AND TYPE OF INITIATION DEVICES (I.E. SMOKE DETECTORS, HEAT DETECTORS, PULL STATIONS, ETC).
2. SEE FLOOR PLANS FOR NUMBER AND TYPE OF NOTIFICATION DEVICES (I.E. HORNS, STROBES, ETC.).
3. FIRE ALARM SYSTEM SHALL BE THE INTELLIGENT ADDRESSABLE TYPE.
4. SEE MECHANICAL PLANS FOR EXACT LOCATIONS OF DUCT SMOKE DETECTORS. PROVIDE A SHUTOFF CIRCUIT TO EACH MECHANICAL UNIT THAT HAS AN ASSOCIATED DUCT SMOKE DETECTOR.

NORTH CAROLINA REGISTERED ENGINEERING FIRM EPIC ENGINEERING INC. No. C00259 DATE OF AUTHORIZATION

NORTH CAROLINA PROFESSIONAL SEAL No. 7188 RODGERS ALLEN

1/6/06

EPIC ENGINEERING INC.
P.O. BOX 2182 • MT. PLEASANT, SC 29465
(843) 884-0775 • FAX: (843) 884-0776

DESIGNED BY:	APPROVED BY:
JRA	JRA
DRAWN BY:	CHECKED BY:
RAD	JRA

REVISIONS

1	DESCRIPTION: / DATE REVISED:
2	DESCRIPTION: / DATE REVISED:
3	DESCRIPTION: / DATE REVISED:

OFFICES AT BELLE HALL BUILDINGS 1 & 2

LONG POINT ROAD
MOUNT PLEASANT, SC

PROJECT TITLE

FIRE ALARM SPECIFICATION

DRAWING TITLE

SCALE: NONE

DATE: 1/06/06

SHEET NUMBER

FA001 of 3

CAD FILE NAME: 05176FA001