PART 1 GENERAL

1.1 DESCRIPTION

A. This specification includes furnishing, installing, connecting, and testing of a new fire alarm system, including Underwriters Laboratories (UL) listed application software and hardware complete and ready for operation.

B. This is a one-for-one replacement of the existing fire alarm system except as noted. All fire alarm cable must be replaced per NEC Electric Code where hooks/hangers are provided every four feet. Where possible, cable should be concealed in sheetrock or above the ceiling. All exposed cable visible to dormitory guests shall be run in metal wire-mold secured by screws. Wire-mold shall be run in the most aesthetically pleasing method as practicable. Conduit is acceptable in areas not visible to dormitory guests, such as mechanical rooms. Removal of the old system is required which includes patching damaged walls/ceilings. Covering electrical back-boxes with a plate is permissible. The customer will be responsible for painting. All existing fire alarm equipment shall be replaced with new equipment and all equipment necessary to make a complete and operational system shall be provided including but not limited to the following:

All, Fire Marshal submittals and fees
All, New cabling
  1, Notifier 3030 Control Panel or equivalent complete with dialer and backup batteries
  1, Surge suppressor for incoming power; telephone lines; addressable and AV circuits
  2, Auxiliary power supplies complete with backup batteries
20, Horn strobes
  8, Strobes
  35, Photoelectric Smoke Detectors
10, Manual pull stations

The following devices do not already exist.

  62, Son-alert or equivalent audible alert for each sleeping room -- mounted above the doors
  8, Directional sounders
  1, Remote annunciator in lobby

C. This system shall include full onsite warranty for one year from Fire Marshal acceptance including all required first year testing and inspections. System shall also include required IP dialers, etc. as necessary for off-site 24 hour monitoring.

D. The Fire Marshal submittals shall be provided using the existing original drawings as reference. Include all costs to reproduce drawings as necessary to provide necessary submittals.
E. The system shall comply with requirements of NFPA Standard No. 72 except as modified and supplemented by this specification.

1.2 SCOPE

A. A UL listed fire alarm monitoring system shall be installed in accordance to the project specifications, and all equipment shall be provided to make it a UL listed fire alarm monitoring system.

B. The monitoring system shall include, but not be limited to, one or more annunciators; control panels, all input/output devices, network communications media, control equipment, auxiliary control devices, power supplies, and wire / fiber optic media.

C. The system shall include furnishing UL listed digital alarm communicator receivers for monitoring remote building systems.

D. The system shall allow a mixture of different technologies and manufacturers’ equipment to operate on the same network and provide the operator with a consistent look and operation for all monitored equipment.

E. The system shall support a variety of topologies and media and shall provide an industry standard open architecture transport layer protocol.

F. Using standard RS 232 ports on existing and future monitoring and control systems used by the facility, the system shall connect to and interpret status change data transmitted from the ports and provide graphic annunciation, control, history logging and reporting as specified herein.

G. The system shall be electrically supervised and monitor the integrity of all conductors.

1.3 SUBMITTALS

A. General

1. One copy of all submittals shall be submitted to the owner for review.
2. All references to manufacturer’s model numbers and other pertinent information herein are intended to establish minimum standards of performance, function and quality.
3. Equivalent compatible equipment (UL listed) from other manufacturers may be considered as a substitution for the specified equipment as long as the minimum standards are met.
4. Substitute equipment proposed as equal to the equipment specified herein shall meet or exceed the minimum specified standard. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment.

B. Shop Drawings

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Wiring diagrams shall indicate all wiring for each item of equipment and the interconnections between the items of equipment.

3. Include manufacturer’s name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.

C. Manuals

1. Submit simultaneously with the shop drawings & submittals complete operating manuals and technical data sheets.

2. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system.

3. Approvals shall be based on complete submissions of manuals together with shop drawings.

1.4 GUARANTY

A. All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one-year period shall be included in the submittal bid.

PART 2 PRODUCTS

2.1 GENERAL

A. The system shall be non-proprietary.

B. Substitute equipment proposed as equal to the equipment specified herein shall meet or exceed the minimum specified standard. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment.

C. All equipment and components shall be new, and the manufacturer’s current model. The materials, equipment and devices shall be tested and listed by a nationally recognized approval agency.

2.2 MAIN FIRE ALARM CONTROL PANEL OR NETWORK NODE:

A. The main FACP Central Console shall be a Notifier Model 3030 or equivalent and shall contain a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, control circuits, and notification appliance circuits, local and remote operator terminals, annunciators, and other system controlled devices.

B. In conjunction with intelligent Loop Control Modules and Loop Expander Modules, the main FACP shall perform the following functions:
1. Supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions.

2. Supervise all initiating signaling and notification circuits throughout the facility by way of connection to addressable monitor and control modules.

3. Detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed.

4. Visually and audibly annunciate any trouble, supervisory, security or alarm condition on operator's terminals, panel display, and annunciators.

C. System Capacity and General Operation

1. Each SLC module shall support a minimum of 318 analog/addressable devices.

2. The Fire Alarm Control Panel shall include a full featured operator interface control and annunciation panel that shall include a backlit 640-character liquid crystal display.

3. All programming or editing of the existing program in the system shall be achieved without special equipment.

D. Central Processing Unit

1. The Central Processing Unit shall communicate with, monitor, and control all other modules within the control panel. Removal, disconnection or failure of any control panel module shall be detected and reported to the system display by the Central Processing Unit.

2. The Central Processing Unit shall also provide a real-time clock for time annotation of all system events. The time-of-day and date shall not be lost if system primary and secondary power supplies fail.

3. The CPU shall be capable of being programmed on site without requiring the use of any external programming equipment. Systems that require the use of external programmers or change of EPROMs are not acceptable.

4. Each peripheral device connected to the CPU shall be continuously scanned for proper operation. Data transmissions between the CPU and peripheral devices shall be reliable and error free. The transmission scheme used shall employ dual transmission or other equivalent error checking techniques.

E. Display

1. The system display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters.

2. The display assembly shall contain, and display as required, alphanumeric labels for all intelligent detectors, addressable modules, and software zones. The program keyboard shall be a full QWERTY keypad.

F. Loop (Signaling Line Circuit) Control Module:

1. The Loop Control Module shall monitor and control a minimum of 318 intelligent addressable devices. This includes 159 intelligent detectors (Ionization, Photoelectric, or Thermal) and 159 monitor or control modules.

2. The Loop Control Module shall contain its own microprocessor and shall be capable of operating in a local/degrade mode (any addressable device input
shall be capable of activating any or all addressable device outputs) in the unlikely event of a failure in the main CPU.

3. The Loop Control Module shall provide power and communicate with all intelligent addressable detectors and modules on a single pair of wires.

4. The Signaling Line Circuit (SLC) interface board shall receive analog or digital information from all intelligent detectors and shall process this information to determine whether normal, alarm, or trouble conditions exist for that particular device. Each SLC Loop shall be isolated and equipped to annunciate an Earth Fault condition. The SLC interface board software shall include software to automatically detect and warn of the accumulation of dust in each detector. The analog information may also be used for automatic detector testing and the automatic determination of detector maintenance requirements.

G. Enclosures:

1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.

2. The back box and door shall be constructed of steel with provisions for electrical conduit connections into the sides and top.

3. The door shall provide a key lock and include a transparent opening for viewing all indicators.

4. The control unit shall be modular in structure for ease of installation, maintenance, and future expansion.

H. Digital Voice Command Center

1. The Digital Voice Command Center located with the FACP shall contain all equipment required for all audio control, emergency telephone system control, signaling and supervisory functions. This shall include speaker zone indication and control, telephone circuit indication and control, digital voice units, microphone and main telephone handset.

2. Function: The Voice Command Center equipment shall perform the following functions:

   a. Operate as a supervised multi-channel emergency voice communication system.

   b. Operate as a two-way emergency telephone system control center.

   c. Provide all-call Emergency Paging activities through activation of a single control switch.

   d. Provide a factory recorded “library” of voice messages and tones in standard WAV. File format, which may be edited and saved on a PC running a current Windows® operating system.

   e. Provide a software utility capable of off-line programming for the VCC operation and the audio message files. This utility shall support the creation of new programs as well as editing and saving existing program files. Uploading or downloading the VCC shall not inhibit the emergency operation of other nodes on the fire alarm network.

   f. The Digital Voice Command shall be modular in construction, and shall be capable of being field programmable without requiring the return of any components to the manufacturer and without requiring use of any external computers or other programming equipment.
g. The Digital Voice Command and associated equipment shall be protected against unusually high voltage surges or line transients.

I. Power Supply:

1. The Addressable Main Power Supply shall operate on 120/240 VAC, 50/60 Hz, and shall provide all necessary power for the FACP.
2. The Addressable Main Power Supply shall provide the required power to the CPU using a switching 24 VDC regulator and shall incorporate a battery charger for 24 hours of standby power using dual-rate charging techniques for fast battery recharge.
3. The Addressable Main Power Supply shall provide a battery charger for 24 hours of standby using dual-rate charging techniques for fast battery recharge. The supply shall be capable of charging batteries within a 48-hour period.
4. The Addressable Main Power Supply shall provide a very low frequency sweep earth detect circuit, capable of detecting earth faults.
5. The Addressable Main Power Supply shall be power-limited per UL864 requirements.

J. System Circuit Supervision

1. The FACP shall supervise all circuits to intelligent devices, transponders, annunciators and peripheral equipment and annunciate loss of communication with these devices. The CPU shall continuously scan above devices for proper system operation and upon loss of response from a device shall sound an audible trouble, indicate which device or devices are not responding and print the information in the history buffer.
2. Transponders that lose communication with the CPU shall sound an audible trouble and light an LED indicating loss of communications.
3. Sprinkler system valves, standpipe control valves, PIV, and main gate valves shall be supervised for off-normal position. Although there is no sprinkler system in the building now, it will be added during future renovation.
4. All speaker and emergency phone circuits shall be supervised for opens and shorts. Each transponder speaker and emergency phone circuit shall have an individual ON/OFF indication.

K. Field Wiring Terminal Blocks

1. All wiring terminal blocks shall be capable of terminating up to 12 AWG wire.

L. Audio Message Generator (Prerecorded Voice)/Speaker Control:

1. Each initiating zone or intelligent device shall interface with an emergency voice communication system capable of transmitting a prerecorded voice message to all speakers in the building.
2. Actuation of any alarm initiating device shall cause a prerecorded message to sound over the speakers. Pre- and post-message tones shall be supported.
3. A built-in microphone shall be provided to allow paging through speaker circuits.

M. Controls with associated LED Indicators:

1. Speaker Switches/Indicators
a. The speaker circuit control switches/indicators shall include visual indication of active and trouble status for each speaker circuit in the system.
b. The speaker circuit control panel shall include switches to manually activate or deactivate each speaker circuit in the system.

2. Emergency Two-Way Telephone Control Switches/Indicators
   a. The emergency telephone circuit control panel shall include visual indication of active and trouble status for each telephone circuit in the system.
   b. The telephone circuit control panel shall include switches to manually activate or deactivate each telephone circuit in the system.

N. Remote Transmissions:
   1. Provide local energy or polarity reversal or trip circuits as required.
   2. The system shall be capable of operating a polarity reversal or local energy or fire alarm transmitter for automatically transmitting fire information to the monitoring company.
   3. Provide capability and equipment for transmission of zone alarm and trouble signals to remote operator's terminals, system printers and annunciators.
   4. Transmitters shall be compatible with the systems and equipment they are connected to such as timing, operation and other required features.

O. System Expansion:
   1. The main FACP and required components must be of a design that allows the system to be expanded in the future to include the addition of twenty percent more circuits or zones without disruption or replacement of the existing control panel. This shall include hardware capacity, software capacity and cabinet space.

P. Field Programming
   1. The system shall be programmable, configurable and expandable in the field without the need for special tools, laptop computers, or other electronic interface equipment. There shall be no firmware changes required to field modify the system time, point information, equations, or annunciator programming/information.
   2. It shall be possible to program through the standard FACP keyboard all system functions.
   3. All field defined programs shall be stored in non-volatile memory.
   4. Two levels of password protection shall be provided in addition to a key-lock cabinet. One level shall be used for status level changes such as point/zone disable or manual on/off commands (Building Manager). A second (higher-level) shall be used for actual change of the life safety program (installer).

Q. Specific System Operations
   1. The FACP shall support audible and silent walktest modes.

R. System Point Operations:
1. Any addressable device in the system shall have the capability to be enabled or disabled through the system keypad.
2. System output points shall be capable of being turned on or off from the system keypad.
3. System Status Reports: Upon command from an operator of the system, a status report will be generated listing all system statuses:
4. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 1000 system events. Each of these events will be stored, with time and date stamp, until an operator requests that the contents be either displayed or printed. The contents of the history buffer may be manually reviewed; one event at a time, and the actual number of activations may also be displayed. History events shall include all alarms, troubles, operator actions, and programming entries.
5. The history buffer shall use non-volatile memory.
6. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent system detector and shall analyze the detector responses over a period of time.
7. If any intelligent detector in the system responds with a reading that is below or above normal limits, then the system will enter the trouble mode, and the particular Intelligent Detector will be annunciated on the system display. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
8. The system shall include the ability (programmable) to indicate a "pre-alarm" condition. This will be used to alert maintenance personal when a detector is at 80% of its alarm threshold in a 60-second period.

2.3 SYSTEM COMPONENTS:

A. Programmable Electronic Sounders
   1. Electronic sounders shall operate on 24 VDC nominal.
   2. Electronic sounders shall be field programmable without the use of special tools, at a sound level of at least 90 dBA measured at 10 feet from the device.

B. Speakers
   1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 watts.
   2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
   3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
   4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

C. Strobe lights shall meet the requirements of the ADA, UL Standard 1971, be fully synchronized, and shall meet the following criteria:
   1. The maximum pulse duration shall be 2/10 of one second.
   2. Strobe intensity shall meet the requirements of UL 1971.
   3. The flash rate shall meet the requirements of UL 1971.
D. Directional Sounders

1. Directional Sounder units shall consist of a speaker assembly with an integral audio amplifier that produces sound consisting of broadband low, mid and high range sounds in specific pulse patterns to draw people to evacuation routes through hearing.

2. Directional sounders shall be supplemental to the normal audio alarm indicating appliances and shall be activated whenever the normal audio alarm indicating appliances are activated. Directional Sounders shall incorporate four different field-selectable sound pulse patterns consisting of broadband noise making it possible for building occupants to locate where the sound is coming from. The four pulse patterns shall be used to create an egress pathway out of the building and mark perimeter exits.

3. Where multiple sounders are located in sequence in an exit route, the sound pattern on each successive unit shall be set to become faster as the building occupant approaches the perimeter exit. Three additional tone pulses can be added to each of the four basic pulse patterns. Two of the tone pulses shall be used to alert occupants that they are approaching a stairway and need to proceed either up or down. The third tone pulse shall be a distinct tone used to identify areas of refuge.

4. Directional sounders shall be UL 464 listed and feature field selectable power settings of ½, 1, 2, and 4 watts. The wattage setting shall be determined by the fire alarm contractor considering the conditions in which it will be installed and noted on the fire alarm shop drawings. Sound levels shall be verified and wattage settings adjusted after installation so that units are optimally heard.

5. Units shall have a low-profile semi-flush design and mount to a recessed 4” x 4” x 2 ¼ back-box. Units shall be Notifier Onyx Exitpoint, System Sensor model PF24 or similar.

2.4 SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices - General

1. Addressable devices shall provide an address-setting means using rotary decimal switches.

2. Addressable devices shall use simple to install and maintain decade (numbered 0 to 9) type address switches. Devices which use a binary address or special tools for setting the device address, such as a dip switch are not an allowable substitute.

3. Detectors shall be Analog and Addressable, and shall connect to the fire alarm control panel's Signaling Line Circuits.

4. Addressable smoke and thermal detectors shall provide dual (2) status LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected.

5. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system.

6. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.
7. The detectors shall be ceiling-mount and shall include a separate twist-lock base which includes a tamper proof feature.
8. The following bases and auxiliary functions shall be available:
   a. Sounder base rated at 85 DBA minimum.
   b. Form-C Relay base rated 30VDC, 2.0A
   c. isolator base
9. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel.
10. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (example: ION, PHOTO, THERMAL).

B. Addressable Manual Fire Alarm Box (manual station)
   1. Addressable manual fire alarm boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.
   2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
   3. Manual fire alarm boxes shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters one-half inch tall or larger.

C. Intelligent Photoelectric Smoke Detector
   1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

D. Intelligent Thermal Detectors
   1. Thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (57 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. It shall connect via two wires to the fire alarm control panel signaling line circuit.

E. Addressable Dry Contact Monitor Module
   1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLCs.
   2. The IDC zone shall be suitable for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.
   3. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.
G. Two Wire Detector Monitor Module

1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional 2-wire smoke detectors or alarm initiating devices (any N.O. dry contact device).
2. The IDC zone may be wired for Class A or B (Style D or Style B) operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

H. Addressable Control Module

1. Addressable control modules shall be provided to supervise and control the operation of one conventional NACs of compatible, 24 VDC powered, polarized audio/visual notification appliances.
2. The control module NAC may be wired for Style Z or Style Y (Class A/B) with up to 1 amp of inductive A/V signal, or 2 amps of resistive A/V signal operation.
3. Audio/visual power shall be provided by a separate supervised power circuit from the main fire alarm control panel or from a supervised UL listed remote power supply.
4. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC.

I. Addressable Relay Module

1. Addressable Relay Modules shall be available for HVAC control and other building functions. The relay shall be form C and rated for a minimum of 2.0 Amps resistive or 1.0 Amps inductive. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.

J. Isolator Module

1. Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC Class A or Class B branch. The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC loop segment or branch. At least one isolator module shall be provided for each floor or protected zone of the building.
2. If a wire-to-wire short occurs, the isolator module shall automatically open-circuit (disconnect) the SLC. When the short circuit condition is corrected, the isolator module shall automatically reconnect the isolated section.
3. The isolator module shall not require address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator module after its normal operation.
4. The isolator module shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

K. Serially Connected Annunciator Requirements

1. The annunciator shall communicate to the fire alarm control panel via an EIA 485 (multi-drop) two-wire communications loop. The system shall support two
6,000 ft. EIA-485 wire runs. Up to 32 annunciators, each configured up to 96 points, may be connected to the connection, for a system capacity of 3,072 points of annunciation.

2. An EIA-485 repeater shall be available to extend the EIA-485 wire distance in 3,000 ft. increments. An optional version shall allow the EIA-485 circuit to be transmitted over Fiber optics. The repeater shall be UL864 approved.

3. Each annunciator shall provide up to 96 alarm and 97 trouble indications using a long-life programmable color LEDs. Up to 96 control switches shall also be available for the control of Fire Alarm Control Panel functions. The annunciator will also have an "ON-LINE" LED, local piezo sounder, local acknowledge and lamp test switch, and custom zone/function identification labels.

4. Annunciator switches may be programmed for System control such as, Global Acknowledge, Global Signal Silence, Global System Reset, and on/off control of any control point in the system.

5. An optional module shall be available to utilize annunciator points to drive EIA-485 driven relays. This shall extend the system point capacity by 3,072 remote contacts.

6. The LED annunciator shall offer an interface to a graphic style annunciator and provide each of the features listed above.

2.5 BATTERIES AND EXTERNAL CHARGER:

A. Battery:

1. Shall be 12 volt, Gell-Cell type.
2. Battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.
3. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks refilling, spills and leakage shall not be required.

B. External Battery Charger:

1. Shall be completely automatic, with constant potential charger maintaining the battery fully charged under all service conditions. Charger shall operate from a 120/240-volt 50/60 hertz source.
2. Shall be rated for fully charging a completely discharged battery within 48 hours while simultaneously supplying any loads connected to the battery.
3. Shall have protection to prevent discharge through the charger.
4. Shall have protection for overloads and short circuits on both AC and DC sides.

PART 3 EXECUTION

3.1 GENERAL

A. All equipment and components shall be installed in strict compliance with manufacturers’ recommendations. Consult the manufacturer’s installation manuals for all wiring & fiber optic diagrams, schematics, physical equipment sizes, etc., before beginning system installation. Refer to the riser/connection diagram for all specific system installation / termination / wiring data.
3.2 CONDUIT AND WIRE
A. Reuse of existing conduit shall be in accordance with the National Electrical Code (NEC), local and state requirements.

B. Cable must be separated from any open conductors of power, or class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.

C. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

D. Conduit shall not enter the control equipment, or any other remotely mounted control panel equipment or back-boxes, except where conduit entry is specified by the FACP manufacturer.

E. Contractor shall confirm the existing fiber optics are compatible with their system and shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors & fiber optics shall be as recommended by the fire alarm system manufacturer.

F. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system except as specified herein.

3.3 TERMINAL BOXES, JUNCTION BOXES, AND CABINETS
A. All boxes and cabinets shall be UL listed for their use and purpose.

3.4 SYSTEM SETUP & CONFIGURATION
A. Provide the services of a factory trained and authorized technician to perform all system software modifications, upgrades or changes. Field technicians shall be NICET Level 3 (minimum) certified.

B. The factory trained technician shall install initial data at each workstation including:
   1. Distribution of monitoring, control and security profiles as requested by owner.
   2. Screen titles.
   3. Auto-navigation criteria.
   4. Guidance text as provided by owner.

3.5 FINAL INSPECTION
A. At the final inspection a factory trained technician shall demonstrate that the system functions properly in every respect.
3.6 INSTRUCTION/TRAINING

A. Provide instruction as required for operating the system. Hands on demonstrations of the operation of all system components and the entire system including user-level program changes and functions shall be provided.

END