

SECTION 283111 - DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 -GENERAL

1.1 SECTION INCLUDES

- A. This specification provides the requirements for the installation, programming and configuration of a complete Addressable Intelligent Fire Alarm System Network. The system shall include, but not limited to: networkable fire alarm control panel and remote annunciators, automatic and manually activated alarm Initiating and indicating peripheral devices and appliances, conduit, wire and accessories required to furnish a complete and operational fire alarm and communications system. The system software platform shall also have the capability for future integration of card access and closed circuit television security directly from the network control panels while maintaining UL 864 listing. This is a part of a Multi-System configuration and shall be supplied by the same systems designer/integrator.

1.2 REFERENCES

- A. The equipment and installation shall comply with the current provisions of the following standards:
1. National Electric Code, Article 760.
 2. National Fire Protection Association Standards:
 3. NFPA72 National Fire Alarm Code
 4. International Building Code
 5. International Mechanical Code
 6. Local Building Codes.
 7. N.J. Uniform Construction Code
 8. Local Authorities Having Jurisdiction.
 9. Underwriters Laboratories Inc.
- B. The system and all components shall be listed by Underwriters Laboratories Inc. for use in fire protective signaling system under the following standards as applicable:
1. UL 864/UOJZ, APOU Control Units for Fire Protective Signaling Systems.
 2. UL 268 Smoke Detectors for Fire Protective Signaling Systems.
 3. UL 268A Smoke Detectors for Duct Applications.
 4. UL 521 Heat Detectors for Fire Protective Signaling Systems.
 5. UL 228 Door Holders for Fire Protective Signaling Systems.
 6. UL 464 Audible Signaling Appliances.
 7. UL 1638 Visual Signaling Appliances.
 8. UL 38 Manually Activated Signaling Boxes.
 9. UL 346 Waterflow Indicators for Fire Protective Signaling Systems.
 10. UL 1971 Standard for Signaling Devices for the Hearing Impaired
 11. UL 1481 Power Supplies for Fire Protective Signaling Systems.
 12. UL 1711 Amplifiers for Fire Protective Signaling Systems.

- C. Shall also comply with:
1. Americans with Disabilities Act (ADA)
 2. International Standards Organization (ISO)
 3. ISO-9000
 4. ISO-9001

1.3 SYSTEM DESCRIPTION

- A. The Fire Alarm System supplied under this specification shall be a microprocessor-based network system. All control panel assemblies and connected field appliances shall be both designed and manufactured by the same company, and shall be tested and cross-listed as compatible to ensure that a fully functioning fire alarm system is designed and installed.

1.4 SUBMITTALS

1.5a PRODUCT DATA

- A. The contractor shall submit <six (6)> complete sets of documentation within 30 calendar days after award of contract. Indicated in the documentation will be the type, size, rating, style, catalog number, manufacturers' names, photos, and/or catalog data sheets for all items proposed to meet these specifications. The proposed equipment shall be subject to the approval of the Architect/Engineer and no equipment shall be ordered or installed on the premises without that approval.

1.5b SHOP DRAWINGS

- A. A complete set of Shop Drawings, one for each unit sub-assembly, which requires that a field wire be connected to it, shall be supplied. The Shop Drawings shall be reproduced electronically from a master copy supplied by the manufacturer in digital format.
- B. Typical Worst Case Scenario for battery calculations and voltage drops shall be acceptable.
- C. Provide copy of State License to perform such work.
- D. Provide copies of NICET Level III Fire Alarm certification for the Technicians assigned to this project.

1.5d CLOSE-OUT SUBMITTALS

- A. <Three (3)> copies of the following manuals shall be delivered to the building owner's representative at the time of system acceptance. The close out submittals shall include:
1. Operating manuals covering the installed fire alarm system.
 2. Point-to-point diagrams of the entire fire alarm system as installed. This shall include all connected smoke detectors and addressable field modules. A system generated electronic Map of the SLC Circuit in PDF format shall be acceptable in Lieu of CAD drawings.
 3. Name, address and telephone of the authorized factory representative.

4. All drawings must reflect device address and programmed characteristics as verified in the presence of the engineer and/or the end user unless device addressing is electronically generated, and graphically printed.

1.5 QUALITY ASSURANCE

1.6a QUALIFICATIONS

- A. The system distributor shall provide proof of their qualifications as factory authorization and factory training for the products specified herein. These qualification credentials shall not be more than two years old, to insure up-to-date product and application knowledge on the part of the system provider. They shall also have and maintain on board a minimum of two (2) Factory Certified EST Master Technicians who have complete knowledge and experience of all EST Manufactured Fire Alarm Systems.
- B. The factory authorized distributor and Service provider is required to have been in the fire alarm industry for a minimum of fifteen (15) years.
- C. Factory authorized distributor must be licensed in the state of project location and have been incorporated in the business in that state for a minimum of fifteen (15) years.
- D. The distributor shall have successfully supplied similar system fire detection and signaling control components on a previous project of comparable size and complexity. The Owner reserves the right to reject any control components for which evidence of a successful prior installation performed by the Contractor cannot be provided.
- E. The Factory authorized distributor shall have in-house engineering; a minimum of two (2) individuals NICET level IV certified and project management capability consistent with the requirements of this project. Qualified and approved representatives of the system manufacturer shall perform the detailed engineering design recommendations of central and remote control equipment. Qualified and approved representatives of the system manufacturer shall produce all panel and equipment drawings and submittals, operating manuals. The Factory authorized distributor is responsible for retaining qualified and approved representative(s) of those system manufacturer specified for detailed system design, documentation, coordination of system installation requirements, and final system testing and commissioning in accordance with these specifications.
- F. System design recommendations must be by individual holding a minimum of NICET level III certification. A copy of this certification must be provided, and the designer must sign off on the plans.
- G. Contractor shall be located within seventy five (75) miles of the installation site.
- H. Prime bidder and installer of systems in this specification shall be a licensed electrical contractor.
- I. Qualifications for contractors must be submitted in writing with the bid.

1.6b WARRANTY

- A. Warranty all installation and workmanship for one (1) year from date of system acceptance, unless otherwise specified.

- B. All EST manufactured components, i.e. control panels, annunciators, detectors, manual stations, audible and visual signals, shall be warranties for a period of one (1) year from date of system acceptance.
- C. A copy of the manufacturers' warranty shall be provided with closeout documentation and included with the operation and installation manuals. The Fire Alarm distributor shall maintain a service organization with adequate spare parts stock within seventy five <75> miles of the installation. Any defects that render the system inoperative shall be repaired within twenty four <24> hours of the owner notifying the contractor. Other defects shall be repaired within forty eight <48> hours of the owner notifying the contractor.

1.6 SYSTEM STARTUP, OWNERS INSTRUCTIONS, COMMISSIONING

- A. System startup shall be performed by a factory trained and authorized engineered systems distributor. Certain functions of the systems startup procedure may be performed by the installing electrical contractor under the direction of the factory trained and authorized engineered systems SSC distributor.
- B. Owners' instructions and operation manuals, specific for this project, shall be supplied to the building operations staff by the factory trained and authorized engineered systems distributor. A "generic" or "typical" owners' instruction and operation manual shall not be acceptable to fulfill this requirement.
- C. Commissioning of the installed system shall be performed by the factory trained and authorized engineered systems distributor in the presence of the local AHJ, the building owners' representative, and a representative of the general contractor, if deemed appropriate.
- D. A system generated device map, which will serve as an "as-built" drawing shall be provided to the local AHJ and the building owners' representative.

1.7 MAINTENANCE AND EXTENDED WARRANTY

- A. Upon system acceptance, the factory trained and authorized engineered systems distributor who provided the system shall provide the owner with a proposal for a separate maintenance contract for a period of three (3) years from the date of system commissioning. Upon acceptance of proposed separate maintenance (3) year contract an extended warranty shall also be provided.

1.8 COORDINATION OF MONITORING

- A. Provide / include a 1 year monitoring and reporting contract (to the Fire Alarm Vendors Central Station only) along with the 1 year Warranty of EST Manufactured components as specified in paragraph 1.06b.

PART 2 -PRODUCTS

2.1 RELATED

- A. This Fire Alarm System Specification must be conformed to in its entirety to ensure that the installed and programmed Fire Alarm System will accommodate all of the future requirements and operations required by the building owner. Any specified item or operational feature not specifically addressed prior to bid date will be required to be met without exception.
- B. The system shall be a Model EST3 as manufactured by Edwards Systems Technology and supplied by their Strategic Partner, Systems Sales Corporation, Neptune, NJ, 732-751-0600. This specification is based upon the performance of not only the EST products but of the past performance of the system provider. EST providers other than Systems Sales Corporation are not automatically considered to be approved equals.
- C. Any deviation from the equipment, operations, methods, design or other criteria specified herein must be submitted in detail to the specifying Architect or Engineer a minimum of 10 working days prior to the scheduled submission of bids. Each deviation from the operation detailed in these specifications must be documented in detail, including page number and section number that list the system function for which the substitution is being proposed.

2.2 EQUIPMENT AND MATERIAL GENERAL REQUIREMENTS

- A. All equipment furnished for this project shall be new and unused. All components and systems shall be designed for uninterrupted duty. All equipment, materials, accessories, devices, and other facilities covered by this specification or noted on contract drawings and installation specifications shall be the best suited for the intended use and shall be provided by a single manufacturer. If any of the equipment provided under this Specification is provided by different manufacturers, then that equipment shall be recognized as compatible by both manufacturers, and "Listed" as such by Underwriters' Laboratories.
- B. System installation and operations shall be verified by the manufacturer's representative and a verification certificate presented upon completion. The manufacturer's representative shall be responsible for an on-site demonstration of the operation of the system and initial staff training as required by the Architect and/or Consulting Engineer.
- C. The system shall be capable of detecting the electrical location of each signature intelligent device including new and existing devices. It shall be possible to display the intelligent device map on the laptop PC.
- D. If a device map cannot be generated by the control panel, the contractor must include a minimum of five (5) days to verify location of all wire runs while in the presence of the Architect/Engineer or building owner's representative to verify all conduit and wire runs.
- E. In addition, "As-Built" riser and wiring diagrams reflecting all T-Taps, each programmed device characteristic including detector type, base type, serial number, sensitivity setting and wire configurations will be provided to the Architect/Engineer, based on the information gathered during the verification process described above.
- F. It shall be possible for authorized service personnel using a program/service tool or laptop PC to change the personality/function of a Signature Series Device to meet changes in building layout or environment. System changes shall be verified by the manufacturer's representative and a verification certificate presented upon completion.

2.3 MANUFACTURERS

- A. Equipment and materials shall be supplied by Systems Sales Corporation, Neptune, NJ (732) 751-0600, to ensure proper specification adherence, final connection, test, turnover, warranty compliance, and service. The base specification is based upon a networked addressable system, EST/Edwards as manufactured by Edwards. Equivalent Systems provided by Simplex or Siemens may be submitted for approval.
- B. Service availability: The supplier shall have sufficient stock on hand and have a fully equipped service organization capable of guaranteeing response time within 8 hours of service calls, 24 hours a day, 7 days a week to service completed systems.
- C. The engineered systems distributor of the fire alarm equipment specified herein shall provide a copy of their certificate of successful completion of an authorized training course given by the manufacturer of the fire alarm equipment.
- D. Equivalent systems provided by Simplex Model 4100U or Siemens Model MXL, will be considered for approval, If equipment of another manufacturer is to be submitted for approval as equivalent, the contractor shall, at the time of bid, list all exceptions taken to these Specifications, all variances from these Specifications and all substitutions of operating capabilities or equipment called for in these Specifications and forward said list to the Engineer. Any such exceptions, variances or substitutions that were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment. Final determination of compliance with these Specifications shall rest with the Engineer, who, at his discretion, may require proof of performance.

2.4 EQUIPMENT

- A. The fire alarm system shall be a multi-processor based peer-to-peer network system designed specifically for Fire and Security applications. The fire alarm system shall be a Model EST3 as manufactured by Edwards Systems Technology (EST) and shall be UL listed under Standards 864, 9th Edition (control units for fire-protective signaling systems) and under categories UOJZ and APOU, SSC. The specified modules shall also be listed under UL 1076 (proprietary burglar alarm units and systems) under category APOU.
- B. The fire alarm system shall include all required hardware and system programming to provide a complete and operational system, capable of providing the protected premises with the following functions and operations:
 - 1. Modular systems design, with a layered application design concept, including an “operational layer” and a “human interface layer”, to allow maximum flexibility of the system with a minimum physical size requirement.
 - 2. All System operational software is to be stored in FLASH memory. Control Panel disassembly, and replacement of electronic components of any kind shall not be required in order to upgrade the operations of the installed system to conform to future application code and operating system changes.
 - 3. Up to 128 Service Groups must be definable within the system program to allow the testing of the installed system based on the physical layout of the system, not on the wiring of the field circuits connected to the fire alarm control panels.

4. Advanced Windows™-based system definition utility with program version reporting to document any and all changes made during system start-up or system commissioning. Time and date stamps of all modifications made to the program must be included to allow full retention of all previous program version data.
5. System response to any alarm condition must occur within 3 seconds, regardless of the size and the complexity of the installed system.
6. System Common Control Functions shall be automatically routed to any node of the system.

2.4a THE FIRE ALARM SYSTEM

2.4b FIRE ALARM SYSTEM MECHANICAL AND OVERALL FEATURE SUMMARY

- A. The Fire Alarm System shall include the following features and shall support the following operations in each installed cabinet or node of the system:
 1. Up to 10 Signature Series Intelligent Device loops per network node.
 2. Up to 125 Intelligent Smoke Detectors and 125 Intelligent Modules per SDC.
 3. Up to 120 Hardwired input/output Circuits.
 4. Up to 342 Manual Control (Input) Switches
 5. Up to 456 LED Annunciation Points
 6. Up to 63 Remote Display Units.
 7. Multi-Priority, token passing, peer-to-peer network connection of up to 64 system nodes wired as Class A (Style 7).
 8. Ground fault detection by panel, by signature data circuit, and by device module.
 9. Ability to download all system applications programs and “firmware” from a computer through any node on the system.
 10. True distributed intelligence, including microprocessor-based detectors and modules.
 11. AC power trouble delay adjustable from 4 Hours to 10 Hours.
 12. Removable, interlocked terminal blocks for the connection of the field wiring to the fire alarm control panel.
 13. Electronic addressing of field devices.
 14. Advanced power management
 15. Dead front construction.

2.4c FIRE ALARM SYSTEM HUMAN INTERFACE

- A. System common controls and emergency user interface
- B. The fire alarm system shall include an emergency operators’ interface panel that shall include the following system annunciation and control functions:
- C. System annunciation and control functions:
 1. Hands free emergency operation. The first and last highest priority event on the system shall be displayed automatically and simultaneously.
 2. Control panel internal audible signal shall have four programmable signal patterns, to allow for the easy differentiation between alarm, supervisory, trouble and monitor conditions within the installed system.

D. 5 Discreet “System Status” LEDs:

1. Power status LED - Green LED shall illuminate when AC power is present.
2. Test status LED - Yellow LED shall illuminate when any portion of the system is in the test mode. A programmable timer shall cause the system to automatically exit the test mode after a period of system inactivity. This test LED shall function in a local or in a group mode.
3. CPU fail status LED - Yellow LED shall illuminate when the panel controller has an internal failure.
4. Ground fault status LED - Yellow LED shall illuminate when ungrounded wiring connected to the cabinets’ power supply has continuity to ground. This feature shall function in either a local or group mode.
5. Disable status LED - Yellow LED shall illuminate whenever any point or zone in the installed system is manually disabled.

E. 4 Discreet Common Control Switches With Associated Status LEDs:

1. Reset: depression of the reset switch starts the system-reset operation. The associated Yellow LED shall have three flash rates during this operation to inform the user of the progress status of the reset cycle. The LED shall flash fast during the smoke detector power down sequence, then it shall flash slowly during the restart phase, and shall illuminate steadily for the restoral phase. The LED shall extinguish when the system is back to normal mode. Each phase, as well the overall reset cycle shall be programmable to perform other functions.
2. Alarm silence: depression of the alarm silence switch shall turn off all audible notification appliance circuits. The associated yellow LED illuminates when the alarm silence function is active, whether by the alarm silence switch, or by an integral software timer. Subsequent activation of the alarm silence switch shall resound the signals. Activation of the alarm silence switch shall be programmable to perform other functions.
3. Panel silence: depression of the panel silence switch shall turn off the systems’ internal audible signal when configured as a ‘local’ system. The associated yellow LED illuminates when the panel silence feature is activated.
4. Drill switch / LED: depressing the drill switch activates the fire drill function. Yellow LED indicates that the fire drill function is active. The drill switch shall also be programmable to perform system functions other than the Drill function.

F. Other Operator Control Switches:

1. Previous message switch: pressing the previous message switch shall scroll the display to show the preceding message in the selected queue. Holding the Previous Message Switch and pressing any queue select switch moves to the top of the respective queue event list. Scrolling through event messages may be done by the operator at any time.
2. Next message switch: pressing the next message switch shall scroll the display to show the following message in the selected queue. Holding the previous message switch and pressing any queue select switch moves to the bottom of the respective queue event list. Scrolling through event messages may be done by the operator at any time.

3. More details switch: Pressing the more details switch shall show the address and 42-character location message of the active device on display. If a zone is active, pressing the switch displays the address and message of active devices within the zone. When multiple devices are active, the “Previous/Next” message switch may be used to scroll through the messages.

G. The System Main Liquid Crystal Display:

1. The liquid crystal display shall provide the means to inform the System Operator with detailed information about the off-normal status of the installed fire alarm system. The main display shall automatically respond to the status of the system, and shall display that status on an 8 line by 21-character backlit alphanumeric graphical liquid crystal display.

H. Automatic Functions:

1. The following status functions shall be annunciated by the main liquid crystal display:
2. When the fire alarm system is in the “normal” mode, the LCD displays:
 - a. The current date and time.
 - b. A custom system title (8 lines X 21 characters).
 - c. A summary total of the alarm history of the system.
3. With the fire alarm system in the alarm mode, the LCD shall automatically reconfigure into four logical windows.
 - a. Systems status window
 - 1) The LCD shall show the system time, and the number of active points and disabled points in the system in this section of the LCD display.
 - b. Current event window
 - 1) The LCD shall show the first active event of the highest priority in reverse text to highlight the condition to the emergency operator. The top line of the reversed text shall show the sequence number in which the displayed event was received, as well as its event type. The second and third lines of reversed text shall display an identification message related to the displayed event.
 - c. Last event window
 - 1) The LCD shall show the most recent, highest priority event received by the system.
 - d. Type status window
 - 1) The LCD shall show the total number of active events in the system, by event type. There shall be four different system event types that shall be displayed, “alarm events”, “supervisory events”, “active trouble events”, and “active monitor events”.

I. System message processing:

1. In order to simplify, and to clarify the system status information that is given to the emergency operator, the main LCD shall include queues for each of the system event types. The main LCD shall allow the emergency operator access to the system status information contained within those queues by pressing an associated queue select switch. Whenever there is an unacknowledged event in any of the system event queues, the associated status LED shall flash. Viewing each event listed in a queue shall acknowledge all events in that queue, and shall cause the associated LED to illuminate steady.
- J. All messages contained in any of the system event queues shall be accessible for review by the emergency operator using the “previous/next” message switch. It shall be possible to route additional event information to a printer.
 1. Maintenance menu:
- K. The main LCD shall also allow the system operator to access system maintenance functions through a four level password system. The authorized system operator shall be able to access the following functions:
 - a. System status
 - 1) The system shall allow the operator to determine the status of individual system components, including active points, disabled points, and active points by panel.
 - b. Enable
 - 1) The system shall allow the operator to restore a disabled point in the system, allowing that point to operate as originally intended by the application program of the system.
 - 2) Additionally, the system shall allow the operator to restore any group function, guard patrol function, Panel, system module, “software - defined zone”, operator control, or time control function.
 - c. Disable
 - 1) The system shall allow the operator to disable any point in the system, inhibiting that point from operating as originally intended by the application program of the system.
 - 2) Additionally, the system shall allow the operator to disable any group function, guard patrol function, Panel, system module, “software - defined zone”, operator control, or time control function within the system.
 - d. Activate
 - 1) The system shall allow the operator to manually turn on any system output point, or system function. Alternate smoke detector sensitivity, message routing within the system, guard patrol timing, and check-in group timings shall be modifiable with this simple command from the control panel.
 - e. Restore

- 1) The system shall allow the operator to restore the primary operation to the smoke detector sensitivity and the message routing functions with this simple command from the control panel.
- f. Control Output
- 1) The system shall allow the operator to manually command and control relays and LEDs. Relays shall be able to be commanded to “latch”, to energize as a “high priority”, or as a “low priority”, to “energize”, or to “de-energize”.
 - 2) LEDs shall be able to be commanded to “latch”, to energize as a “high priority”, or as a “low priority”, to turn “on”, to turn “off”, to “slow blink”, or to “fast blink”.
- g. Reports
- 1) The system shall provide the operator with system reports that give detailed description of the status of certain system parameters for corrective action, or for preventative maintenance programs. The system shall provide these reports via the main LCD, and shall be capable of being printed on any of the connected system printers.
 - 2) The system shall provide a report that gives a sensitivity listing of all detectors that have less than 75% environmental compensation remaining.
 - 3) The system shall provide a report that provides a sensitivity listing of any particular detector.
 - 4) The system shall provide a report that gives a listing of the sensitivity of all of the detectors on any given panel in the system, or any given SDC loop within any given panel.
 - 5) The system shall provide a report that gives a chronological listing of up to the last 1740 system events.
 - 6) The system shall provide a listing of all of the firmware revision listings for all of the installed network components in the system.
- h. Program
- 1) The system shall allow the authorized operator to perform all of the following system functions:
 - Set the system time
 - Set the system date
 - Set (change) the system passwords.
- i. Restart the system.
- 2) Set the dates for the system holiday schedule.
 - 3) Clear the chronological system history file.
- j. Test
- 1) The system shall allow the authorized operator to perform test functions within the installed system. Test functions shall be defined by the

authorized operator to be performed on a per cabinet, circuit, or service group basis.

- 2) Local control and display annunciators
- 3) Each networked control panel in the installed system shall include local control and display annunciators. These annunciators shall have integral membrane style, tactile push-button control switches, for the control of system functions, and LEDs with programmable (software-controlled) flash rates and slide-in labels for annunciation of system events.
- 4) The local control display annunciators shall provide the system with individual device annunciation.
- 5) The local control display annunciators shall provide the system with individual device annunciation with device disable.
- 6) The remote control display annunciators shall provide the system with individual alarm and trouble annunciation per device with device disable.
- 7) The local control and display annunciators shall provide the system with groups of three switches that have software controlled interlocks to allow only one of the switches to be active at any time. The switch triads shall be used for all of the fan and damper controls in the protected premises.

2.5 REMOTE ANNUNCIATORS

- A. Each networked remote panel in the installed system shall include a remote control and display annunciator. These annunciators shall have integral membrane style, tactile push-button control switches for the control of system functions, and LEDs with programmable (software-controlled) flash rates and slide-in labels for annunciation of system events. All remote annunciators shall be an integral part of the Peer to Peer Network capable of displaying 160,000 points. Annunciators that are dependent on a specific Node for operation will not be acceptable.

- 1) The remote control display annunciators shall provide the system with individual device annunciation.
- 2) The remote control display annunciators shall provide the system with individual device annunciation with device disable.
- 3) The remote control display annunciators shall provide the system with individual alarm and trouble annunciation per device with device disable.
- 4) The remote control display annunciators shall provide the system with groups of three switches that have software controlled interlocks to allow only one of the switches to be active at any time. The switch triads shall be used for all of the manual zone/floor paging operations in the protected premises.
- 5) The remote control and display annunciators shall be provided to provide the system with groups of three switches that have software controlled interlock to allow only one of the switches to be active at any time. The switch triads shall be used for all of the fan and damper controls in the protected premises.

2.6 System Printers

- A. The event and status printer shall be a 9-pin, impact, dot-matrix printer with a minimum print speed of 200 characters per second at 10 characters per inch. Printer parameters shall be set up with a menu drive program in the printer. The serial cable connecting the Fire Alarm Control Panel to the Printer shall be supervised. The serial printer shall support short haul modems or Fiber-Optics modules. The printers shall list the time, date, type, and user-defined message for each event printed. It shall be possible to support multiple printers per CPU. It shall be possible to define which event types are sent to the printer(s) including alarm, supervisory, trouble, monitor, and service groups. Install as indicated on drawings.

2.7 Fire alarm system operations interface:

A. SDC Card

1. The signature device card (SDC) shall be the interface between the networked fire alarm control panels and the signature series detectors and modules.
2. The communications format between the SDC and the signature series devices shall be 100% digital. Communications to devices must incorporate broadcast polling and direct address search to ensure the fastest reporting of off-normal conditions to the system human interface layer.
3. It shall be possible to wire the SDC as Class A (Style 6 or Style 7) or Class B (Style 4) without twisted or shielded wire. It must be possible to wire branch circuits (T-Taps) from Class B Circuits.
4. Each addressable analog loop shall be circuited so device loading is not to exceed <80%> of loop capacity in order to leave for space for future devices. The loop shall have Class operation.
5. The associated controller (3-SSDC1), through the SDC, shall provide the ability to set the sensitivity and alarm verification of each of the individual intelligent detectors on the circuit. It shall be possible to automatically set the sensitivity of individual intelligent detectors during day and night periods.
6. It shall be possible for the SDC to address all intelligent devices connected to it without having to set switches at the individual devices.
7. It shall be possible to obtain a mapping report of all devices connected to the circuit for confirmation of "as-built" wiring. The map shall show physical wiring of t-taps, device types, and the panel addresses of devices connected to the circuit. The SDC shall be capable of reporting unexpected additional device addresses and changes to the wiring in the data circuit. A specific trouble shall be reported for any off-normal non-alarm condition.
8. The SDC shall be able to report the following information on a per intelligent device basis:
 - a. Device serial number
 - b. Device address
 - c. Device type
 - d. Current detector sensitivity values and the extent of environmental compensation.
 - e. Any of 32 possible trouble codes to specifically diagnose faults.
9. Should a signature driver controller CPU fail to communicate, the signature circuit shall go into the stand-alone mode. The circuit shall be capable of producing a loop alarm if an alarm type device becomes active during stand-alone mode. This feature shall be demonstrated to the Owner/Architect before final approval.

B. Hard wired NAC circuits

1. Provide where indicated on the plans supervised hard-wired notification appliance circuits (NAC) for the control of 24Vdc EST Genesis signaling appliances. The NAC shall be Class B (Style 4), and shall control up to 3.5 amps of power to the circuit.
2. Panel NAC's shall be power limited to 3.5A at 24Vdc and 4.1A at 20.4Vdc to support higher current demand by visible appliances at lower battery voltages.
3. Each appliance circuit shall be circuited so device loading is not to exceed <80%> of loop capacity in order to leave for space for future devices. The loop shall have Class operation.
4. Life Safety System Programmable Operations:
5. System Message Processing and Display Operations:
 - a. The fire alarm safety system shall allow network routing to be configured to any or all nodes (cabinets) in the network.
 - b. All of the system Printer ports can be configured to display any or all of the following functions:
 - 1) Alarm
 - 2) Supervisory
 - 3) Trouble
 - 4) Monitor
 - 5) Service group
 - c. Each LCD display on each node (cabinet) in the system shall be configurable to show the status of any or all of the following functions anywhere in the system:
 - 1) Alarm
 - 2) Supervisory
 - 3) Trouble
 - 4) Monitor
 - d. The system shall provide the capability to label each of the system points with up to 256 characters of location message. The first 42 characters shall be directed to the LCD while the entire message shall be sent to the printer.
 - e. The system shall have the capability to provide up to 128 logical counting "AND" groups. Each group shall have a programmable activation number. Whenever the number of active devices in an "AND" group reaches the activation number, the "AND" groups rules will execute. It shall be possible to overlap "AND" groups by having devices appear in more than one group.
 - f. The system shall provide a means to monitor the well being of any or all of the occupants of the protected premises by means of a check-in group feature. The check-In group shall display an emergency alarm whenever any member of a check-in group fails to check-in during the programmable check-in period. Subsequent check-in activations during the check-in period or activations outside of the check-in period shall also activate an emergency response. It shall be possible to have a minimum of 128 check-in groups. All event messages for the check-In feature shall be directable to any system monitor or printer.
 - g. The system shall have the ability to define a minimum of 64 guard patrols with up to 10 different tours each. For each tour it shall be possible to program a minimum-maximum time period between patrol stations. Each guard patrol can have up to 50 stations. Guard patrol can be started from the control panel or by

operation of the first station in a tour. Guard patrol delinquencies occur when a guard is early to a station, late to a station and out of sequence. Delinquencies shall display at the control panel, perform programmable system responses, and may be directed to any printer.

- h. The system shall have the ability to define a minimum of 128 Matrix Groups with up to 250 points each. For each matrix, it shall be possible to define a radius and an activation number. The radius number defines the proximity between detector locations. When two detectors activate at or within the value of the radius or whenever the number of active devices reaches the activation number the Matrix Group activates. It shall be possible to overlap Matrix groups by having devices appear in more than one group.
- i. The system shall include the ability to define an alternate set of device commands that may be used in combination with the system test command for the testing of the connected signature series smoke detectors. This function shall disable the normal alarm command for each of the members of the group, so that the testing process will not result in an activation of the building evacuation signals, auxiliary relays or central station connections.
- j. The system shall include time control functions that will have the ability to control any system output or function, or initiate any system operational sequence as a function of the month, day of week, date, hour, minute, or holiday.
- k. The system shall include up to 600 software defined logical zone groups that may group any input from any signature data circuit, or other initiating device circuit, in order to control a system output or function, or initiate any system operational sequence. A device or IDC may be a member of one logical zone group. Each of these zones shall have an associated message.
- l. The system shall provide the ability to download data from the signature series detectors to a P.C. while the system is on-line and operational in the protected premises. The downloaded data may then be analyzed in a diagnostic program supplied by the system manufacturer.

2.8 CENTRAL STATION CONNECTION - EST3 MODEM COMMUNICATOR - 3-MODCOM

- A. The system shall provided an off premise communications module capable of transmitting system events to multiple Central Monitoring Station (CMS) receivers. The module shall provide the CMS with point identification of system events via 4/2, Contact ID or SIA DCS protocols. <The module shall also be capable of transmitting alphanumeric system activity by event to a commercial paging system using TAP Pager protocol.> The dialer shall have the capability to support up to 255 individual accounts and to send account information to eighty (80) different receivers, each having a primary and secondary telephone access number. System events shall be capable of being directed to one or more receivers depending on event type or location as specified by the system designer. The module shall have a degrade mode capable of transmitting fire alarm signals to the CMS in the event of system CPU failure. The module shall provide a high speed (V.32bis or greater) modem function in order to upload and download system data to/from a remote location. It shall be the responsibility of the owner to provide two telephone lines terminated at RJ31X jacks adjacent to the communicator.

- B. The fire alarm system supplier shall include and provide the owner a one year Central Station Monitoring to the Fire Alarm Vendors Central Station, exclusively.

2.9 Components

2.9a Remote Booster Power Supplies

- A. The remote booster power supply shall be EST type BPS10 incorporating a synchronized addressable signal control module so it is activated directly from the addressable loop, insuring signal synchronization throughout the entire facility. All initiating, notification, and low voltage power source circuits shall be power limited.
- B. The booster power supply shall be provided with battery back-up. The batteries shall be of the sealed, lead-acid type and provide twenty-four (24) hours of normal standby operation and five (5) minutes of normal alarm operation at the end of the standby period. The batteries shall be supervised for placement and low voltage.

2.9b Intelligent Detectors - General

- A. The system intelligent detectors shall be capable of full digital communications using both broadcast and polling protocol. Each detector shall be capable of performing independent fire detection algorithms. The fire detection algorithm shall measure sensor signal dimensions, time patterns and combine different fire parameters to increase reliability and distinguish real fire conditions from unwanted deceptive nuisance alarms. Signal patterns that are not typical of fires shall be eliminated by digital filters. Devices not capable of combining different fire parameters or employing digital filters shall not be acceptable.
- B. Each detector shall have an integral microprocessor capable of making alarm decisions based on fire parameter information stored in the detector head. Distributed intelligence shall improve response time by decreasing the data flow between detector and Analog loop controller. Detectors not capable of making independent alarm decisions shall not be acceptable. Maximum total digital loop response time for detectors changing state shall be 0.5 seconds.
- C. Each detector shall have a separate means of displaying communication and alarm status. A green LED shall flash to confirm communication with the Analog loop controller. A red LED shall flash to display alarm status. Both LEDs on steady shall indicate alarm-standalone mode status. Both LEDs shall be visible through a full 360 degree viewing angle.
- D. The detector shall be capable of identifying up to 32 diagnostic codes. This information shall be available for system maintenance. The diagnostic code shall be stored at the detector.
- E. Each smoke detector shall be capable of transmitting pre-alarm and alarm signals in addition to the normal, trouble and need cleaning information. It shall be possible to program control panel activity to each level. Each smoke detector may be individually programmed to operate at any one of five (5) sensitivity settings.
- F. Each detector microprocessor shall contain an environmental compensation algorithm that identifies and sets ambient "Environmental Thresholds" approximately six times an hour. The

microprocessor shall continually monitor the environmental impact of temperature, humidity, other contaminants as well as detector aging. The process shall employ digital compensation to adapt the detector to both 24-hour long term and 4-hour short-term environmental changes. The microprocessor shall monitor the environmental compensation value and alert the system operator when the detector approaches 80% and 100% of the allowable environmental compensation value. Differential sensing algorithms shall maintain a constant differential between selected detector sensitivity and the “learned” base line sensitivity. The base line sensitivity information shall be updated and permanently stored at the detector approximately once every hour.

- G. The intelligent Analog device and the Analog loop controller shall provide increased reliability and inherent survivability through intelligent Analog standalone operation. The device shall automatically change to standalone conventional device operation in the event of a loop controller polling communications failure. In the Analog standalone detector mode, the Analog detector shall continue to operate using sensitivity and environmental compensation information stored in its microprocessor at the time of communications failure. The Analog loop controller shall monitor the loop and activate a loop alarm if any detector reaches its alarm sensitivity threshold.
- H. Each signature series device shall be capable of automatic electronic addressing and/or custom addressing without the use of DIP or rotary switches. Devices using DIP or rotary switches for addressing, either in the base or on the detector shall not be acceptable.
- I. The intelligent Analog detectors shall be suitable for mounting on any Signature Series detector mounting base.

2.9c FIXED TEMPERATURE HEAT DETECTOR, SIGA-HFS

- A. Provide intelligent fixed temperature heat detectors SIGA-HFS as indicated on the plans. The heat detector shall have a low mass thermistor heat sensor and operate at a fixed temperature. It shall continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm. The integral microprocessor shall determine if an alarm condition exists and initiate an alarm based on the analysis of the data. Systems using central intelligence for alarm decisions shall not be acceptable. The heat detector shall have a nominal alarm point rating of 135oF. The heat detector shall be rated for ceiling installation at a minimum of 70 ft centers and be suitable for wall mount applications.

2.9d Fixed temperature/rate of rise heat detector, SIGA-HRS

- A. Provide intelligent combination fixed temperature/rate-of-rise heat detectors SIGA-HRS as indicated on the plans. The heat detector shall have a low mass thermistor heat sensor and operate at a fixed temperature and at a temperature rate-of-rise. It shall continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm. The integral microprocessor shall determine if an alarm condition exists and initiate an alarm based on the analysis of the data. Systems using central intelligence for alarm decisions shall not be acceptable. The intelligent heat detector shall have a nominal fixed temperature alarm point rating of 135oF and a rate-of-rise alarm point of 15oF per minute. The

heat detector shall be rated for ceiling installation at a minimum of 70 ft centers and be suitable for wall mount applications.

2.9e Photoelectric smoke detector, SIGA-PS

- A. Provide intelligent photoelectric smoke detectors SIGA-PS as indicated on the plans. The analog photoelectric detector shall utilize a light scattering type photoelectric smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor shall dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or the SIGA-PRO signature program/service tool. The photo detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The photoelectric smoke detector shall be suitable for direct insertion into air ducts up to 3 ft high and 3 ft wide with air velocities up to 5,000 ft/min. without requiring specific duct detector housings or supply tubes.
- B. The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The photo detector shall be suitable for operation in the following environment:
 - 1. Temperature: 32oF to 120oF
 - 2. Humidity: 0-93% RH, non-condensing
 - 3. Elevation: no limit

2.9f Standard detector mounting bases, SIGA-SB

- A. Provide standard detector mounting bases SIGA-SB suitable for mounting on <North American 1-gang, 3½” or 4” octagon box and 4” square box. The base shall, contain no electronics, support all Signature Series detector types and have the following minimum requirements:
 - 4. Removal of the respective detector shall not affect communications with other detectors.
 - 5. Terminal connections shall be made on the room side of the base. Bases which must be removed to gain access to the terminals shall not be acceptable.
 - 6. The base shall be capable of supporting one (1) Signature Series SIGA-LED Remote Alarm LED Indicator. Provide remote LED alarm indicators where shown on the plans.

2.9g Intelligent Duct Smoke Detector SIGA-SD

- B. The SIGA-SD features electronic addressing and issues a dirty sensor warning when it reaches its preset limit. The dirty sensor warning indicates the sensor is operating within its specified limits but is in need of servicing. When the detector’s ability to compensate for environmental changes has reached its limit, the duct smoke detector signals a trouble condition. Key-operated model (TRK) Remote Test/Reset Stations provide alarm test, trouble indication, and reset capability from a remote location. They include a one-gang plate, momentary SPST switch, red alarm LED, and terminal block.

2.10 INTELLIGENT MODULES -- GENERAL

- A. It shall be possible to address each intelligent signature series module without the use of DIP or rotary switches. Devices using Dipswitches for addressing shall not be acceptable. The personality of multifunction modules shall be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Analog Loop Controller. Modules requiring EPROM, PROM, ROM changes or Dipswitch and/or jumper changes shall not be acceptable. The modules shall have a minimum of 2 diagnostic LEDs mounted behind a finished cover plate. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash to display alarm status. The module shall be capable of storing up to 24 diagnostic codes that can be retrieved for troubleshooting assistance. Input and output circuit wiring shall be supervised for open and ground faults. The module shall be suitable for operation in the following environment:
1. Temperature: 32oF to 120oF (0oC to 49oC)
 2. Humidity: 0-93% RH, non-condensing

2.10a Single input module, SIGA-CT1

- A. Provide intelligent single input modules SIGA-CT1. The single input module shall provide one (1) supervised class B input circuit capable of a minimum of 4 personalities, each with a distinct operation. The module shall be suitable for mounting on 2 ½” deep 1-gang boxes and 1 ½” deep 4” square boxes with 1-gang covers. The single input module shall support the following circuit types:
1. Normally-Open Alarm Delayed Latching (waterflow switches)
 2. Normally Open Active Non-Latching (fans, dampers, doors, etc.)
 3. Normally-Open Active Latching (supervisory, tamper switches, generator status, kitchen hood)

2.10b DUAL INPUT MODULE, SIGA-CT2

- A. Provide intelligent dual input modules SIGA-CT2. The dual input module shall provide two (2) supervised class B input circuits each capable of a minimum of 4 personalities, each with a distinct operation. The module shall be suitable for mounting on 2 ½” deep 1-gang boxes and 1 ½” deep 4” square boxes with 1-gang covers. The dual input module shall support the following circuit types:
1. Normally open alarm delayed latching (waterflow switches)
 2. Normally open active non-latching (monitor, fans, dampers, doors, etc.)
 3. Normally open active latching (supervisory, tamper switches, generator status, kitchen hood)

2.10c SINGLE INPUT SIGNAL MODULE, SIGA-CC1S

- A. Provide intelligent single input synchronized signal modules SIGA-CC1S. The single input signal module shall provide one (1) supervised Class B output circuit capable of a minimum of 2 personalities, each with a distinct operation. The module shall be suitable for mounting on 2 ½” deep 2-gang boxes and 1 ½” deep 4” square box with 2-gang covers.

2.10d CONTROL RELAY MODULE, SIGA-CR

- A. Provide intelligent control relay modules SIGA-CR. The control relay module shall provide one form “C” dry relay contact rated at 2 amps @ 24 Vdc to control external appliances or equipment shutdown. The control relay shall be rated for pilot duty and releasing systems. The position of the relay contact shall be confirmed by the system firmware. The control relay module shall be suitable for mounting on 2 ½” deep 1-gang boxes and 1 ½” deep 4” square boxes with 1-gang covers.

2.11 INTELLIGENT MANUAL PULL STATIONS – GENERAL

- A. It shall be possible to address each Signature Series fire alarm pull station without the use of DIP or rotary switches. Devices using Dipswitches for addressing shall not be acceptable. The manual stations shall have a minimum of 2 diagnostic LEDs mounted on their integral, factory assembled single or two stage input module. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash to display alarm status. The station shall be capable of storing up to 24 diagnostic codes that can be retrieved for troubleshooting assistance. Input circuit wiring shall be supervised for open and ground faults. The fire alarm pull station shall be suitable for operation in the following environment:

1. Temperature: 32oF to 120oF (0oC to 49oC)
2. Humidity: 0-93% RH, non-condensing

2.11a Double Action Manual Pull Station, SIGA-278

- A. Provide intelligent double action, single stage fire alarm stations SIGA-278. The fire alarm station shall be of lexan construction with an internal toggle switch. Provide a key locked test feature. Finish the station in red with white “PULL IN CASE OF FIRE” lettering. The manual station shall be suitable for mounting on 2½” deep 1-gang boxes and 1½” deep 4” square boxes with 1-gang covers.

2.11b Stopper covers for manual stations

- A. Where indicated on the drawings, furnish and install Model No. STI-1130 Stopper II Lexan protective covers with built-in warning horn.

2.12 Conventional fire alarm initiating devices

2.12a High temperature heat detectors, Model 284B-PL

- A. Where shown on the drawings provide low profile heat detectors rated for a maximum smooth ceiling rating of 2500 sq. ft.. The detector shall be finished pure white and have a positive identification for the operation of the fixed temperature element. The detectors shall be rated at 194oF fixed temperature. The conventional heat detectors shall be integrated into the addressable system by connection to a single or dual input monitor module as indicated on the drawings.

2.12b Explosion proof and moisture proof heat detectors, Model 302-AW-135/194 Series

- A. Provide explosion proof and moisture proof heat detectors rated at either 150°F per minute rate-of-rise and 135°F fixed temperature, 135°F or 194°F fixed temperature, as indicated on the drawings. The conventional heat detectors shall be integrated into the addressable system by connection to a single or dual input monitor module as indicated on the drawings.
- 2.12c Weatherproof Manual Pull Stations – Model MPSR2-S45W-GE, dual action rated for wet locations. Weatherproof Manual Pull Station shall be connected to Siga-CT1 Addressable Monitor Module. Addressable Monitor Module shall be mounted in a heated/air conditioned space suitable for electronic modules, as indicated on drawings.
- 2.12d Weatherproof Horn Strobe Units - 757-8A-T with Back Box 757A-WB, manufactured by EST. The sound output shall be 92db and flash output shall be 110cd, as indicated on drawings
- 2.12e Reflective Beam Smoke Detectors-F-5000, Auto Align, shall be UL 268 listed and shall be connected to Siga-CT1 Addressable Monitor Module and consist of an integrated transmitter, receiver and remote control unit. Addressable Monitor Module shall be mounted in a heated/air conditioned space suitable for electronic modules.
- 2.13 NOTIFICATION APPLIANCES -- GENERAL
 - A. All appliances shall be UL Listed for Fire Protective Service.
 - B. All strobe appliances or combination appliances with strobes shall be capable of providing the “Equivalent Facilitation” that is allowed under the Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)), and shall be UL 1971 Listed.
 - C. All appliances shall be of the same manufacturer as the Fire Alarm Control Panel specified to assure absolute compatibility between the appliances and the control panels, and to assure that the application of the appliances is done in accordance with the single manufacturer’s instructions.
 - D. Any appliances that do not meet the above requirements, and are submitted for use must show written proof of their compatibility for the purposes intended. Such proof shall be in the form of documentation from all manufacturers that clearly states that their equipment (as submitted) is 100% compatible with each other for the purposes intended.
- 2.13a Self-Synchronized Strobes
 - A. Strobes
 - B. Self-Synchronized Strobes shall be Edwards Model No. G1RF-VM multi-candela synchronized flash outputs. They shall be UL listed for Fire Protective Service and comply with ADA requirements. Strobes shall mount in a 1-gang electrical box (2-1/8” deep). All strobes shall have lens markings oriented for wall mounting.

C. Horn/Strobes

- D. Provide electronic horn/strobes manufactured by EST, Cat. No. G1RF-HDVM Series. The horn/strobe shall have a red plastic housing. A synchronized temporal pattern sound output level of 97-dBA average shall be provided. The strobe shall provide multi-candela synchronized flash outputs. The strobe shall have lens markings oriented for wall mounting. Horn/strobe shall mount to 1-gang electrical box (2-1/8" deep) electrical box.

2.13b PROTECTIVE WIRE GUARDS FOR AUDIBLE AND/OR VISUAL NOTIFICATION APPLIANCES

- A. Where indicated on the plans, provide protective wire guards for indicating appliances. Guards shall be a minimum of 12 gauge, cold rolled steel with stainless steel finish.

2.13c Electromagnetic Doorholders – General

- A. Electromagnetic door holders submitted for use must have written proof of their compatibility for the purposes intended. Such proof shall be in the form of documentation from all manufacturers that clearly states that their equipment is 100% compatible with each other for the purposes intended.

PART 3 - EXECUTION

- A. The entire system shall be installed in a skillful manner in accordance with approved manufacturers manuals and wiring diagrams. The contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the NEC, approved by local authorities having jurisdiction for the purpose, and shall be installed in dedicated conduit throughout.
- B. All penetration of floor slabs and firewalls shall be fire stopped in accordance with all local fire codes.
- C. End of Line Resistors shall be furnished as required for mounting as directed by the manufacturer.

3.1 WIRING

- A. All SLC circuit wiring terminated to the fire alarm system shall be PLENUM RATED with no exceptions and no less than No. 16 AWG in size, and all NAC circuits no less than 14 AWG.

- B. All line voltage (120VAC) wiring shall be no less than No. 12 AWG in size, and solid copper. This shall include all system grounding. FACP must have a DEDICATED 20 Amp circuit marked back at the power panel NO EXCEPTIONS.
- C. All wiring shall be color-coded throughout, to National Electrical Code standards.
- D. Power-limited/Non-power-limited NEC wiring standards SHALL BE OBSERVED.
- E. Fire alarm system wiring shall not co-mingle with any other system wiring in the facility. Conduits shall not be shared under any circumstance. Only when fire alarm wiring enters the enclosure of a monitored or controlled system will co-habitation be permitted (i.e. at fan starters or elevator controllers). THIS WILL BE FIELD INSPECTED BY THE PROJECT ENGINEER.
- F. All fire alarm wiring shall be continuous and unspliced. Terminations shall only occur at fire alarm devices or control panel enclosures under terminal screws. All other splicing methods are specifically disallowed.(i.e. plastic wirenuts)
- G. All fire alarm wiring shall be installed using a dedicated system of supports (i.e. bridle rings). Fire alarm wiring shall not be bundled or strapped to existing conduit, pipe or wire in the facility. THIS WILL BE FIELD INSPECTED BY THE PROJECT ENGINEER
- H. All fire alarm wiring shall be sleeved when passing through any wall, using conduit sleeves (1"min.) with bushings, and fire stopped in accordance with Code.
- I. The system shall be arranged to receive power from one three wire 120 Vac, 20 A supply. All low voltage operation shall be provided from the fire alarm control panel.
- J. All wiring shall be installed according to NEC standards per the drawings submitted by the Electrical Contractor, unless otherwise noted.

3.2 Field Quality Control

- A. The system shall be installed and fully tested under the supervision of trained manufacturer's representative. The system shall be demonstrated to perform all the functions as specified. The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment (Systems Sales Corporation) shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72, Chapter10.

3.2a FINAL SYSTEM ACCEPTANCE

- A. The final reports may be turned over in hard copy format, but also must be made available online for the owner's review through an inspection portal that allows the user private access to their building, indicating each items tested and inspected, along with the results of the individual tests. Any final system acceptance that does not include this will not be considered

as part of meeting the specification and will be deemed not acceptable. Proof at time of initial submittal of this feature must be made available by submitting the owner's login name and password with the initial equipment submittal. If it is not included at that time, the submittal will be rejected without review. Multiple submissions will incur a review charge by the owner and or their representatives.

3.2b Records and Fire Document Box: Model Number SSC-FDB

- A. The contractor shall provide and mount near the Main Fire Alarm Control Panel a document box designed to limit access to sensitive or important documentation via a high security locked door. This box will be used to contain required copies of maintenance and inspection records, operation manuals, permits, etc as required or set forth by code or the direction of the local AHJ. An internal Pocket holds the documents safely and securely while the hinged door is opened. Access to the documents is via a high security CAT 30 Lock Set. The box shall be manufactured from 16 gauge CRS (Cold Rolled Steel) with a durable red powder coat finish. The door reads "FACP Maintenance Records" in 1" tall white lettering.

3.3 Examination

- A. Prior to the commencement of any of the work detailed herein, an examination and analysis of the areas where the fire alarm system and all associated components are to be installed shall be made by the Contractor.
- B. Any of these areas that are found to be outside the manufacturers' recommended environments for the particular specified products shall be noted on a site examination report which shall be given to the Electrical Engineer/Architect.
- C. Any shorts, opens, or grounds found on existing wiring shall be corrected by the Contractor prior to the connection of these wires to any panel component or field device.

3.4 DEMONSTRATION

- A. Each of the intended operations of the installed fire alarm system shall be demonstrated to the building owner's representative and the local authority having jurisdiction by the system supplier.

END OF SECTION 283111