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**BULLETIN
TO
DESIGN AND CONSTRUCTION PROFESSIONALS**

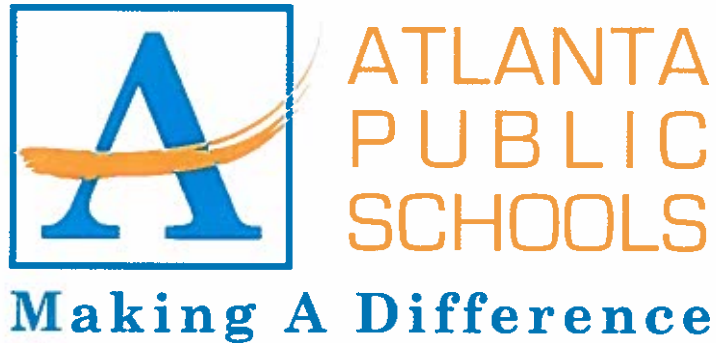
Date: July 1, 2017
Bulletin: 0003 – 2017
Section: 28 31 00 – Fire Alarm System
Re: APS Design Guidelines and Standard Specifications Update

- Item 1:** This is a clarification, change or addition to the existing Atlanta Public Schools (APS) Design Guidelines and Standard Specifications dated December 1, 2010 and any previous Bulletins.
- Item 2:** This set of requirements and specifications should be implemented IMMEDIATELY on all projects that are in the "Construction Document" phase of the project delivery process. On projects where the "Construction" has begun, these requirements and specifications should be implemented IMMEDIATELY, WHERE PRACTICAL as to not adversely impact the schedule, budget or overall delivery of the project.
- Item 3:** The existing APS Standard Specification Section 28 31 00 Fire Alarm System should be replaced in entirety by the attached updated version (dated May 8, 2017, 22 pages).



Jere J. Smith III, AIA
Director of Capital Improvements

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Fire Alarm Services



Facilities and Construction

1631 La France Street NE
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Fire Alarm Specifications

May 8, 2017

Reviewed By:

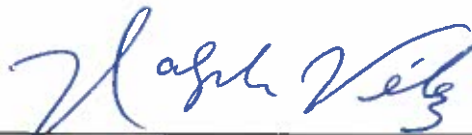


Charles Johnson, APS Building Systems Programmer

5-8-17

Date

Approved By:



Ralph Velez, Director of Security

5/8/2017

Date

Fire Alarm Specification Change Summary:

- 1.) Section 3.1.3 – Change enunciator to annunciator
- 2.) Add Section 3.3.10 – Final testing documentation performed in accordance with NFPA 72 testing procedures
- 3.) Section 3.3.6 – Change NICER to NICET
- 4.) Remove Section 3.7 – This section pertains to Grady HS
- 5.) Section 3.15.1 – Remove EST 3 as an alternate
- 6.) Section 3.44.3 – Change audio –LED visual indicator to magnet or key test LED visual indicator
- 7.) Section 3.49.2 – Change two telephone lines to one telephone line and one network connection and send signal utilizing the phone as backup.
- 8.) Section 3.49.4 – Change Silent Knight 5104 to Notifier UDACT telephone dialer and Notifier IP communicator
- 9.) Section 3.50.2 – Change Audiosone Series AU-360 to Notifier DVC
- 10.)Section 3.50.16 – Change Fore to Fire
- 11.)Add 3.61.1 – Testing shall be performed in accordance with NFPA72 and all testing documentation shall be provided with completion documentation.
- 12.)Section 3.74.1 – Remove Mircom FX2000 and Edwards LSS4

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1.0 CURRENT SITUATION

APS has contracts with multiple vendors to provide fire alarm services on an as needed basis. APS has a mixed variety of fire alarm systems including Notifier, EST, Simplex, Silent Night, and Firelite. The integration plan includes viewing all alarm activity including alarms, troubles, supervisory down to the device. The plan includes device health monitoring over the network as well as remote function control of the system.

3.0 SCOPE OF WORK

- 1) 3.1.1 This solicitation outlines the requirements by which the Atlanta Public Schools plans to enter into an agreement with a qualified vendor to provide new installation, day to day maintenance, emergency repairs, and/or annual inspections, as needed and possible systems integration. The Owner's representative and or her designee will identify the procedures by which work request will be assigned.
- 2) The SOW includes the provisioning and installation and final commissioning of a fully functional NFPA 72 Fire Alarm system that is fully compatible and expandable with the districts integration plan. This shall encompass compatibility in operation, design, functionality, and manufacturer specification.
- 3) Fire Alarm System, includes Control Panel(s), Initiating Devices, Notification Appliances, auxiliary control and monitor devices, annunciators, power supplies, and wiring per Drawings and as specified herein.
- 4) Duct mounted smoke detectors installed by Division 15; Furnish and connect to fire alarm system by Division 16. Provide manufacturer mounting instructions to Division 15. Please refer to separate attachment.
- 5) Fire protection water valve and flow devices provided by Division 15; connect to devices requiring supervisory monitoring by fire alarm system.
- 6) The vendor must insure complete connectivity and integration to each existing system in those instances where an addition or upgrade is warranted.
- 7) New construction projects shall be competitively bid among the vendors who are approved from this solicitation.

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3.2 STANDARDS

- 3.2.1 Standards, Current edition being enforced by local Authority Having Jurisdiction and/or as applicable:
- 3.2.2 ADA: American with Disabilities Act
- 3.2.3 ANSSI/ASME A 17.1: Safety Code for Elevators and Escalators.
- 3.2.4 FM (Factory Mutual)
- 3.2.5 NEMA “Guide for Proper Use of System Smoke Detectors.”
- 3.2.6 NEMA “Guide for Proper Use of Smoke Detectors in Duct Applications.”
- 3.2.7 NEMA SB 28-1997: Product Safety Guide for Developing Documentation for Fire Alarm Systems and Equipment.
- 3.2.8 NFPA 13: Installation of Sprinkler Systems.
- 3.2.9 NFPA 72: National Fire Alarm Code.
- 3.2.10 NFPA 101: Life Safety Code.
- 3.2.11 UL 13, 1996: Power-Limited Circuit Cables.
- 3.2.12 UL 38, 1999: Manually Actuated Signaling Boxes for Use With Fire Protective Signaling Systems.
- 3.2.13 UL 217, 1997: Single and Multiple Station smoke Alarms.
- 3.2.14 UL 268, 1996: Smoke Detectors for Fire Protective Signaling Systems.
- 3.2.15 UL 268A, 1998: Smoke Detectors for Duct Application.
- 3.2.16 UL 497B, 1999: Protectors for Data Communication and Fire Alarm Circuits.
- 3.2.17 UL 521, 1999: heat Detectors for Fire Protective Signaling Systems.
- 3.2.18 UL 539, 1995: single and Multiple Station Hear Detectors.
- 3.2.19 UL 864, 1996: Control units for Fire protective Signaling Systems.
- 3.2.20 UL 1424, 1996: Cables for Power-limited Fire Alarm Circuits.
- 3.2.21 UL 1425, 1998: cables for Non-power Limited Fire Alarm Circuits.
- 3.2.22 UL 1481, 1994: Power Supplies for Fire Protective Signaling Systems.

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3.2.23 UL 1638, 1995: Visual Signaling Appliances-Private mode Emergency and General Utility Signaling.

3.2.24 UL 1971, 1995: signaling devices for the Hearing impaired.

3.3 The following documents are needed for newly installed equipment:

3.3.1 Summary index page listing each component, manufacturer and catalog number.

3.3.2 Manufacturer Data Sheet for each component, clearly marked to show specific item and catalog number, ratings, listings, input power, internal wiring and connection diagrams.

3.3.3 Scaled Floor Plan prepared by manufacturer-authorized representative:

- a. AutoCAD 2000 format, minimum 1/8" = 1'-0".
- b. Legend, each equipment, device and device address.
- c. Point-to-point wiring and conduit layout with detailed description.

3.3.4 System Operation description, detailed, clear and concise.

3.3.5 Detailed spreadsheet with zone descriptions that match panel programming and Software back-up of main fire panel program.

3.3.6 Certification from major equipment manufacturer, showing proposed personnel as authorized representatives, factory-trained, NICET Level II or higher. Include names, addresses and certifications for:

- a. Supervisor and Installation.
- b. Installers.
- c. Testing Personnel.
- d. Contract Maintenance Personnel

3.3.7 Required programming software.

3.3.8 Required security keys necessary for programming.

3.3.9 After installation of a fire alarm system, a Manufacturer Operation and Maintenance Manual for each system component shall also be included.

3.3.10 Final testing and documentation per NFPA 72

3.4 SOURCE

3.4.1 All products described herein shall be supplied by Fire Alarm System manufacturer.

3.4.2 Items shown on Drawings are minimum required. System designer shall verify and comply with all Owner requirements and include in the final Shop Drawing design.

3.4.3 ABBREVIATIONS

- a. AFF : Above Finished Floor.
- b. AHJ : Authority Having Jurisdiction.
- c. BAS : Building Automation System.
- d. CPU : Central Processing Unit.
- e. DDC : Direct Digital Control.
- f. EDP : Electronic Data Processing.
- g. FACP : Fire Alarm Control Panel.
- h. IDC : Initiating Device Circuit.

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- i. I/O : Input / Output.
 - j. LCD : Liquid Crystal Display.
 - k. LED : Light Emitting Diode.
 - l. NAC : Notification Appliance Circuit.
 - m. NRTL : Nationally Recognized Testing Laboratory.
 - n. PLFA : Power-Limited Fire Alarm.
 - o. SLC : Signaling Line Circuit.
 - p. TSP : Twisted Shielded Pair
- 3.4.4 Separate and distinct alarm transmittal for each zone or device supervisory and trouble signal to Main FACP. Simultaneous operation of all circuits and no signal loss or interference.
- 3.4.5 Active/interrogative type system, including:
- a. Repetitive scan of each module and node.
 - b. Signal to FACP indicating functional device and circuit wiring.
 - c. Upon signal loss, indicate trouble status at FACP.
- 3.4.6 Circuiting: Arrange IDCs to serve like categories (eg: manual, smoke). Mixed categories are not acceptable. Exception: SLCs connected to intelligent reporting devices.
- 3.5 MALFUNCTIONS**
- 3.5.1 A single ground on any SLC, IDC or NAC shall not cause system malfunction, operating power loss, or alarm reporting ability.
- 3.5.2 Alarm signals at FACP shall not be lost following power failure until signal is processed and recorded.
- 3.5.3 OPERATION – SPECIFIC
- 3.5.4 FACP: When device alarms, the following occurs at FACP:
- a. “Alarm” LED flashes.
 - b. Piezo-electric sounds.
 - c. LCD display shows alarm information, including device type and location. Annunciators show same information.
 - d. History logs alarm information, time and date.
 - e. Outputs activate (Indicating Appliances, relays, etc.).
- 3.6 PERIPHERAL: When device alarms, the following occurs as programmed:**
- 3.6.1 Actuate Notification Appliances until FACP is reset and enabled.
- 3.6.2 Release magnetic door holders and fire shutters.
- 3.6.3 Enable elevator control interface outputs.
- 3.6.4 Activate outputs interfacing with HVAC equipment, BAS, DDC and CASS.
- 3.7 HVAC EQUIPMENT CONTROL**
- 3.7.1 When duct mount smoke detector alarms, shut down respective HVAC unit.
- 3.7.2 Provide I/O modules with contacts for control interfaces.

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3.7.3 Upon “alarm”, shut down exhaust ventilation fans.

3.7.4 HVAC units serving critical equipment shall not shut down until respective unit smoke detector alarms. Coordinate and verify with Division 15.

3.8 ELEVATOR CONTROL

3.8.1 Provide I/O module “alarm” interface with elevator controllers, programmed as follows:

3.8.2 Return to Main Floor.

3.8.3 Return to Alternate Floor.

3.8.4 Elevator Machine Rooms and Elevator Shafts: Provide smoke and heat detectors to shut down elevator power before sprinkler system activation. Heat detector shall have low response time index and lower temperature rating than sprinkler head temperature activation rating.

3.8.5 Elevator Lobbies: Provide smoke detector programmed to initiate recall functions.

3.9 OPERATING SEQUENCE

3.9.1 When detector alarms in Elevator Equipment Room, recall elevator car to Primary Recall floor, with subsequent car operation by firefighters only.

3.9.2 When detector alarms in Elevator Lobby other than at assigned Primary Recall floor, recall elevator car to assigned Primary Recall floor with subsequent car operation by firefighters only.

3.9.3 When detector alarms in Elevator Lobby on assigned Primary Recall floor, recall elevator to assigned Alternate Recall floor.

3.9.4 Provide interface to shunt trip control elevator input power at power source.

3.10 INTERFACE WITH OTHER TRADES

3.10.1 Field coordinate interface and wiring of devices furnished and mounted by other Divisions and which are monitored by Fire Alarm System.

3.11 OPERATION AND MAINTENANCE MANUAL

3.11.1 Manufacturer Warranty.

3.11.2 Operating instructions, including complete programming procedures.

3.11.3 Manufacturer recommended maintenance procedures.

3.11.4 AutoCAD 2000 electronic “.dwg” files of items indicated above in SUBMITTALS. Drawings shall reflect “As-Built” conditions, including raceway routing.

3.12 TRAINING

3.12.1 System vendor shall provide (8) eight hours on-site training of APS personnel in operation, programming, and maintenance of FACP and system devices. Training will be scheduled by APS.

3.12.2 Provide “Hands-On” demonstration of entire system, including programming.

3.12.3 After new units are installed, the vendor shall provide a type written “Sequence of Operation” to the Director of Security or designee.

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3.13 METHOD OF PROCEDURE (MOP): Install per Owner-approved MOP, manufacturer installation standards, Shop Drawings, and calculations. Where violations are unacceptable per Owner, modify at no extra cost or scheduling delay to Owner.

3.14 MANUFACTURE

3.14.1 Notifier 640 (or alternates, by approval, Fire-Lite 9600 Micro-Scan).

3.14.2 Smoke detectors pull stations, notification appliances, etc. same manufacture and compatible with panel.

3.14.3 Where component is described by catalog number or model series, furnish complete with all standard features shown on manufacturer data sheet for that product.

3.15 CONDUCTORS, WIRING METHODS AND ENCLOSURES

3.15.1 Conduit: See Section 16110.

3.15.2 Provide wiring recommended by Fire Alarm System manufacturer and as follows, unless otherwise noted herein:

- a. Completely supervised.
- b. Listed by NRTL for use with Protective Signaling System.
- c. IDCs and SLCs: #18 AWG (1.02 mm) minimum size.
- d. NACs: #16 AWG (1.32 mm) minimum size.

3.15.3 Terminal Boxes and Cabinets

3.15.4 NRTL Listed for intended purpose

3.15.5 NEMA 12, hinged lockable door.

3.15.6 Conductors terminated on barrier type terminal blocks.

3.15.7 "Sta-Kon" type connectors. Exception: Box type / pressure plate terminals.

3.15.8 Permanent number on each conductor and terminal.

3.15.9 Permanent engraved nameplate on cabinet.

3.16 FIRE ALARM CONTROL PANEL

3.16.1 CPU, microprocessor based, modular construction, to communicate with and control detectors, modules, enunciators, local and remote operator terminals, printers and other controlled devices.

3.17 FUNCTIONS AND FEATURES

3.17.1 Supervise devices for normal, trouble, and alarm conditions.

3.17.2 Supervise IDCs, SLCs and NACs.

3.17.3 Detect and report activation and location of initiating devices.

3.17.4 Operate Notification Appliances and auxiliary devices as programmed.

3.17.5 Visually and audibly annunciate trouble, supervisory or alarm condition on operator's terminal, FACP display, and enunciators.

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- 3.17.6 Field-programmable without use of external equipment or EPROM change.
- 3.17.7 Integral protection from line transients, voltage surges, RFI and EMI.
- 3.17.8 Continuously scan each peripheral device for proper function. Provide reliable, error-free data transmission between CPU, transponders, and peripherals via dual transmission or equivalent error-check method. If any peripheral fails to respond to an interrogation, annunciate a trouble condition.

3.18 CAPACITY AND GENERAL OPERATION

- 3.18.1 Expansion capability.
- 3.18.2 Operator interface control and annunciation.
- 3.18.3 Program editing without special equipment and without interrupting alarm monitoring.
- 3.18.4 Additional Features, as required by APS.

3.19 ENCLOSURE

- 3.19.1 Semi-flush mount, manufacturer standard finish.
- 3.19.2 Back box and door, minimum .060" steel, conduit provisions in sides and top.
- 3.19.3 Key lock reversible hinged door, with transparent opening to view indicators.
- 3.19.4 Modular structure for ease of installation, maintenance, and future expansion.

3.20 CPU FUNCTIONS

- 3.20.1 Communicate with, monitor and control all other modules within FACP.
- 3.20.2 Detect and report removal, disconnection or failure of any FACP module.
- 3.20.3 Contain and execute control-by-event programs for action upon alarm.
- 3.20.4 Provide real-time clock for time recording of system displays.
- 3.20.5 Hold programs, time-of-day and date in non-volatile memory, not lost even upon primary and secondary power failure.

3.21 DISPLAY

- 3.21.1 Backlit LCD, 80 character, with keypad customizable alphanumeric designations for detectors, modules and zones.
- 3.21.2 Five (5) individual LEDs, color-coded, indicating status of AC Power, System Alarm, System Trouble, Display Trouble, and Signal Silence.

3.22 LOOP INTERFACE BOARD

- 3.22.1 Monitor and control each SLC.

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3.22.2 Monitor and process analog information from each detector or module to determine status (normal, trouble or alarm) and proper function.

3.23 SERIAL INTERFACE BOARD EIA-232: interface between FACP and multiple EDP peripherals.

3.23.1 SERIAL INTERFACE BOARD EIA-485:

3.23.2 Shall provide port for the serial connection of the Enunciators and Control Subsystem components.

3.23.3 Shall have LEDs which will show that it is in regular communication with the Enunciators or other EIA-485 connected peripheral device.

3.24 POWER SUPPLIES

3.24.1 Main FACP: 120 VAC, 60 Hz, providing all power for FACP and Notification Appliances per Drawings, using switching 24 VDC regulator.

3.24.2 Battery charger for 24 hours of standby power, using dual-rate-charging method for fast recharge.

3.24.3 Meters indicating battery voltage and charging current.

3.25 SYSTEM CIRCUIT SUPERVISION

3.25.1 Individually supervise for off-normal condition:

- a. Each fire protection water standpipe control valve.
- b. Each main gate valve.
- c. Each fire protection water flow switch.

3.26 OPERATOR CONTROL—Provide the following switches, functions and controls:

3.26.1 ACKNOWLEDGE (ACK/STEP)

3.26.2 In response to new alarm and/or trouble condition:

- a. Silence all panel and enunciator local piezo audibles.
- b. Change System Alarm or Trouble LED from flash mode to steady-ON mode.

3.26.3 In response to subsequent new alarm and/or trouble conditions: Advance LCD display to next alarm and/or trouble condition.

3.27 SIGNAL SILENCE: Cause user-selectable, field-programmed Alarm Audible Notification Appliances and relays to return to normal condition.

3.28 SYSTEM RESET

3.28.1 Cause electronically-latched initiating devices, appliances or software zones, and associated output devices and circuits, to return to normal condition.

3.28.2 If alarm condition(s) still exist or reoccur after operation, resound alarms.

3.29 SYSTEM TEST: Initiate automatic test of detectors:

3.29.1 Simulate alarm condition at detector and transmit from detector to FACP, which interprets data from each detector.

3.29.2 Display test results on LCD, CRTs and printers.

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3.30 LAMP TEST: Sequentially turn on LEDs, LCD and local piezo sounder, then automatically return FACP to previous condition.

3.31 TOUCH KEYPAD, with two different access password levels, to command system functions, enter alphanumeric information, and field program.

3.32 FIELD PROGRAMMING

3.32.1 Programmable, configurable and expandable in the field without special tools, electronic equipment or field replacement of electronic integrated circuits.

3.32.2 Field-defined programs stored in non-volatile memory.

3.32.3 Password-Enabled

3.32.4 Specifically defined at installation.

3.32.5 MINIMUM TWO LEVELS

3.32.6 SYSTEM REQUIREMENT

3.32.6.1 Status level changes, eg: zone disable or manual On/Off.

3.32.6.2 Program Change.

3.32.7 Program any addressable input or initiating device to operate any single or group of addressable output devices or NACs. Inputs programmable to generate alarm, trouble, or no audible alarm.

3.33 SYSTEM OPERATIONS

3.33.1 System Point Operations via Keypad

3.33.1.1 Any device enabled or disabled.

3.33.1.2 Any output point turned on or off.

3.34 POINT READ: Display point status diagnostic functions without peripheral equipment, each point annunciated with parameters listed:

3.34.1 Device status.

3.34.2 Device type.

3.34.3 Custom device label.

3.34.4 Software zone label.

3.34.5 Device zone assignment.

3.34.6 Program parameters.

3.35 SYSTEM HISTORY BUFFER: FACP shall store system output, input and control events in non-volatile memory, with time and date stamp, to print or display, in total or one event at a time, by operator command

3.36 MISCELLANEOUS

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3.36.1 PERIPHERAL DEVICES: All peripheral devices shall be intelligent, addressable type. Where surface mount, provide manufacturer standard surface mount box.

3.37 NOTIFICATION APPLIANCES

3.37.1 White with red lettering.

3.37.2 Visible Notification Appliance

3.37.3 24 VDC nominal.

3.37.4 Per ADA and UL standard 1971, and as follows:

3.37.4.1 Pulse Duration: 0.2 second maximum.

3.37.4.2 Luminous Intensity: 75 candela, unless otherwise noted.

3.37.4.3 Flash Rate: 1 Hz minimum, 3 Hz maximum.

3.37.5 Flush cover plate where installed flush.

3.37.6 Synchronized where more than one visible at same time.

3.38 COMBINATION AUDIBLE/VISIBLE NOTIFICATION APPLIANCE

3.38.1 Meet applicable audibility requirements.

3.38.2 Meet Visible Notification Appliance requirements.

3.38.3 Flush cover plate where installed flush.

3.38.4 Speaker/Strobe: The fire alarm speaker shall be Gentex SPKE4-110. The speaker shall be capable of producing alarm tones of voice on all 25 or 70 VRMs audio systems.

3.38.5 The speaker shall provide incremental tap settings of 1/8, 1/4, 1/2, 1, 2 or 4 watts Minimum dB ratings at 1/4 watt shall be 85 and at 4 watts 92dB. Tap settings shall be adjustable with field selectable jumper pins.

3.38.6 The speaker shall also have an optional visual signal capability.

3.38.7 The visual signal shall have a 1Hz flash rate regardless of input voltage. All field wiring connections shall be made via separate in-out terminal connections and the speaker or speaker strobe shall be UL, CSFM, BS&A and BFP-listed and comply with all local, state and federal fire alarm codes/standards.

3.38.8 The speaker/strobe shall comply with ADA requirements of synchronization. Speaker/Strobe shall flush wall or ceiling mount to a standard 4" Square x 2-1/8" back box with a 1-1/2" extension ring. Provide quantity as shown on drawings.

3.38.9 Provide Gentex SPKE4-110 Speaker Strobes.

3.39 AUDIBLE NOTIFICATION APPLIANCE

3.39.1 Meet applicable audibility requirements.

3.39.2 Flush cover plate where installed flush.

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3.39.3 Shall be field programmable without the use of special tools, to provide slow whoop, continuous, or interrupted tone (Temporal Patter) with an output sound level of at least 90 DBA measured at 10 feet from the device.

3.40 MANUAL STATION

3.40.1 Send status data to FACP.

3.40.2 Key operated test-reset lock, which, after emergency operation, cannot be restored to normal use except by use of key.

3.40.3 Positive visual indication of operation that cannot be reset without key.

3.40.4 Single action, cast metal or high impact Lexan.

3.40.5 Operating Instructions: Clearly visible on cover, with "FIRE" in raised letters, 1.75" high or larger.

3.40.6 Surface or semi flush mount.

3.40.7 Clear plastic keyed cover.

3.41 SMOKE AND HEAT DETECTORS

3.41.1 General

3.41.2 Connect to FACP SLC Loop via 2-wires

3.41.3 Ceiling Mount with twist-lock base.

3.41.4 Test means: Simulate alarm condition, either by magnetic switch on detector, simulated smoke, or remotely at FACP. Report alarm to FACP.

3.41.5 Address setting means: Rotary decimal switches or electronically through programming and internal identifying code by which FACP identifies detector type.

3.41.6 Visible Annunciation: LED, indicating conditions as follows: (1.) Normal – Flashing (operational and communicating with FACP), field-programmable (2.) Alarm – Steady On (controlled by FACP)

3.41.7 Output Provision: Connection in base for external remote alarm LED.

3.42 PHOTOELECTRIC SMOKE DETECTOR

3.42.1 Provide only photoelectric type detectors, unless otherwise noted.

3.42.2 Send status data to FACP, indicating analog level of smoke density.

3.42.3 Sensitivity

3.42.3.1 Set via FACP, field-programmable.

3.42.3.2 Automatic compensation for dust and other slow environmental changes.

3.42.3.3 UL Listed to meet calibrated sensitivity testing per NFPA 72.

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3.43 IN-DUCT SMOKE DETECTOR, HOUSING AND REMOTE INDICATOR

3.43.1 Continuous analog monitoring and alarm verification from FACP.

3.43.2 Upon alarm, FACP initiates appropriate action on air handling systems to help prevent smoke and toxic gas distribution via duct system.

3.43.3 Where detector is in above-ceiling space or other normally concealed or difficult to observe area, provide remote magnetic or key test LED visual indicator, one per each detector, visible from floor level in vicinity below detector. Before construction, verify exact location with Architect.

3.44 HEAT DETECTOR:

3.44.1 Electronic type, sending status data to FACP, indicating analog level of thermal measurement.

3.45 MODULES

3.45.1 Monitor Module (Addressable Input Device)

3.45.1.1 Connects one IDC zone of conventional alarm initiating device(s) (any N.O. dry contact device) to one FACP SLC loop.

3.45.1.2 Mounting: In 4" square, 2.125" deep electrical box.

3.45.1.3 Visible Annunciation: Flashing LED indicating normal operation, communicating with FACP, field-programmable.

3.45.2 Control Module (Addressable Output Device)

3.45.2.1 Connects one conventional NAC, speaker or telephone circuit. For auxiliary control, can be set to operate as dry contact relay.

3.45.2.2 Mounting: In 4" square, 2.125" deep electrical box, or surface mount back box, or directly in FACP.

3.45.2.3 Visible Annunciation: Flashing LED indicating normal operation, communicating with FACP, field-programmable.

3.45.2.4 Testing: Magnetic switch, without opening or shorting NAC wiring.

3.46 ISOLATOR MODULE

3.46.1 Isolator Modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC loop. 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. At least one isolator module shall be provided for each floor and SLC loop or protected zone of the building.

3.46.2 If a wire-to-wire short occurs, the Isolator Module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the Isolator Module shall automatically reconnect the isolated section of the SLC loop.

3.46.3 The Isolator Module shall not require any address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an Isolator Module after its operation.

3.46.4 The Isolator Module shall mount in a standard 4-inch deep electrical box, in a surface mounted back box, or in the Fire Alarm Control Panel. It shall provide a single LED which

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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.

3.47 REMOTE DISPLAY ANNUNCIATOR

3.47.1 Features

3.47.2 80-character Liquid Crystal Display (LCD)

3.47.3 Control switches for Acknowledge, Silence, Reset

3.47.4 Time and Date Field

3.47.5 Local piezo sounder with resound feature

3.47.6 Mimic FACP display panel

3.47.7 Mounting

3.47.8 Flush mount in finished areas

3.47.9 Surface mounting in unfinished areas in suitable surface box

3.47.10 Input Power: Provide power from main FACP

3.48 DIGITAL COMMUNICATOR

3.48.1 The digital communicator shall transmit the fire alarm and supervisory signals to a central station. The central station service will be provided under a separate contract by the Owner. The digital communicator shall be UL or FM listed for reporting the fire to a central station and shall conform to the requirements of NFPA.

3.48.2 The control communicator shall supervise one telephone line and one network connection, seize the phone line and send the alarm signal on one or both lines without the addition of any more equipment. It shall sound a local trouble signal if the telephone service is interrupted for longer than 45 seconds and shall transmit a signal that indicates the loss of phone line service to the central station over the remaining phone line. A signal shall also be transmitted indicating the restoration of the phone service. If both phone line fail a local signal shall sound.

3.48.3 The control/communicator shall have the ability to send a test signal to the central station every 24 hours.

3.48.4 Provide Notifier dialer and Notifier network device, with all operating, programming and maintenance software required.

3.49 VOICE EVACUATION PANEL

3.49.1 Provide an Evacuation Alarm Signal and Voice Transmission over the system speakers. All equipment shall be UL Listed.

3.49.2 The System shall be Notifier DVC Voice Evacuation Alarm equipment integrated with a UL Listed 24 VDC Fire Alarm Control panel.

3.49.3 Speaker lines shall be 25 or 70 VRMS, supervised for both open and short circuits. Speakers shall be UL Listed Life Safety rated with DC blocking capacitors. Amplifier, Signal Generator,

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power supply, output transformer and Speaker Lines shall be continuously supervised for normal operation, open or short circuits.

- 3.49.4 Amplifier shall be capable of withstanding a continuous output short circuit while in Alarm without failure, fusing or shutdown.
- 3.49.5 The system shall be capable of operating as a Non-fire or Emergency Public Address System without interfering with normal Alarm functions.
- 3.49.6 Provision shall be made for connection of Remote Microphone Paging stations, such as the Audiosone AU-562-2, which are normally disabled during an Alarm.
- 3.49.7 A Battery Saver circuit shall be incorporated which can reduce power consumption of the Voice Evacuation Alarm module(s) during an AC power failure. Amplifier shall incorporate "Voice Band" filtering for increased speech intelligibility (400 – 4,000 Hz Bandwidth).
- 3.49.8 Protection circuitry shall be incorporated to prevent failure due to output overload, overheating, output open/short circuits, over and under voltage conditions and input power polarity reversal. Automatic current limiting shall be provided to keep circuitry within safe operating limits without shutdown.
- 3.49.9 System shall incorporate a built-in unitone generator (including ANSI/NFPA temporal pattern signal with general evacuation alert).
- 3.49.10 Operation shall result in a "Slow Whoop" evacuation alert signal.
- 3.49.11 Provide Digital Message Repeater instructions for occupants to evacuate the building. Live voice paging overrides and reset of the recording by keying the microphone.
- 3.49.12 Message shall be Standard: Female voice, 15 seconds. "Attention please ... Attention please". The signal you have just heard indicates a report of an emergency in this building.
- 3.49.13 Walk to the nearest exit and leave the building. All handicapped occupants shall follow the building evacuation plan".
- 3.49.14 Provide necessary amplifier power requirement and speaker zoning required for this project per ANSI/NFPA.
- 3.49.15 Provide Audiosone AU-360 Series Evacuation Panel, all software for programming, operating and maintenance.
- 3.49.16 The Voice Evacuation Panel shall be mounted adjacent to the Fire Alarm Control Panel.

3.50 BATTERY SYSTEM

- 3.50.1 Type: 12 volt, gel cell, maintenance-free. No liquids, refilling, spills or leakage detection required.
- 3.50.2 Backup Power Duration: Per applicable codes, minimum 24 hours.

3.51 EXECUTION (General)

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3.51.1 Provide factory-trained, manufacturer-authorized personnel on site to supervise system tests and adjustments, demonstrate proper system operation to Owner representative, and program system per Owner requirements.

3.51.2 Provide NFPA "Certificate of Completion and Certification" documents for complete system, indicating compliance with applicable requirements.

3.52 MATERIAL REQUIRED

3.52.1 Provide Conductors required for furnished system, per drawings prepared by system manufacturer. Conductor quantity shown on Construction Documents is not intended to meet needs of all manufacturers.

3.52.2 Device Quantities shown on Drawings represent general configuration and may not reflect actual quantity of devices and modules required. Provide components shown on Drawings and additional as required for system functions described herein.

3.53 INSTALLATION (General)

3.53.1 Provide installation per standards indicated, local and state codes, Drawings, and manufacturer recommendation.

3.53.2 Conduit shall enter equipment only at locations recommended by manufacturer.

3.53.3 Fasten and support components securely. Do not support detectors solely from suspended ceiling tiles.

3.53.4 In Finished Areas:

3.53.4.1 Conceal conduits, hangers, J-boxes, etc.

3.53.4.2 Flush mount or semi-flush mount devices, cabinets, back boxes, etc.

3.53.5 In Unfinished Areas: Surface mount installation is acceptable.

3.54 MOUNTING HEIGHTS

3.54.1 Manual Stations: 45" AFF.

3.54.2 Notification Appliances:

3.54.2.1 Combination Audible/Visible: 80" AFF, or top at 6" below ceiling, whichever is lower.

3.54.2.2 Visible Only: Same as Combination Audible/Visible.

3.54.2.3 Audible Only: 96" AFF.

3.55 LOCATIONS – GENERAL

3.55.1 Locate area detectors to avoid supply air discharge; maintain 48" minimum separation and coordinate with Division 15.

3.55.2 Locate duct mount detectors per NFPA and coordinate with Division 15.

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3.55.3 Locate modules in conspicuous places, as approved by Architect.

3.56 CONDUCTORS

3.56.1 Install in EMT conduit or other raceway type as allowed by Section 16110.

3.56.2 Separate from other system conductors per NEC 760-54.

3.56.3 Provide two dedicated telephone lines to each FACP, exact location per APS Safety and Communications. Permanently and clearly label "FIRE ALARM SYSTEM TELEPHONE LINE, 1 OF 2" and "FIRE ALARM SYSTEM TELEPHONE LINE, 2 OF 2".

3.57 DUCTMOUNT DETECTOR AND REMOTE INDICATOR

3.57.1 Settings: Set sensitivity for airflow encountered, as recommended by manufacturer.

3.57.2 Locate remote alarm indicator to be normally visible from floor level in vicinity below detector. Before construction, verify exact location with Architect.

3.58 IDENTIFICATION

3.58.1 Provide red band markers, pre-printed "FIRE ALARM", around conduits at 20' maximum spacing's.

3.58.2 Paint J-boxes and covers red.

3.58.3 Paint exposed raceways to match adjacent finish surface color.

3.58.4 Engraved Plate for each:

3.58.4.1 FACP.

3.58.4.2 Transponder.

3.58.4.3 Module.

3.59 SMOKE DETECTOR INSTALLATION

3.59.1 Do not install before final construction cleanup of all trades is complete. Replace detectors installed before final cleanup and recertify system.

3.59.2 Do not install before system programming and test period.

3.60 TESTING

3.60.1 Testing to be performed in accordance with NFPA72. Testing documentation to be turned in with all closeout documentation.

3.61 GENERAL

3.61.1 Before energizing conductors, verify correct connections, and perform short circuit, ground fault and continuity testing.

3.61.2 Using walk test, check installation, supervision, and operation of each detector.

3.61.3 Verify proper operation of program log, including HVAC and elevator interface.

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3.62 ALARM SIGNALS

- 3.62.1 Introduce each alarm condition.
- 3.62.2 Verify proper receipt and processing at FACP.
- 3.62.3 Verify each control point activation.

3.63 VERIFY TROUBLE SIGNAL ACTUATION ON EACH CIRCUIT, UNDER EACH CONDITION:

- 3.63.1 IDC open.
- 3.63.2 SLC open.
- 3.63.3 NAC open and short.
- 3.63.4 IDC ground.
- 3.63.5 SLC ground.
- 3.63.6 NAC ground.

3.64 SYSTEM PROGRAMMING

- 3.65 Provide initial programming, incorporating Owner requirements, as specified herein.
- 3.66 Request program requirements from Owner, minimum one month before initial system startup. Assist Owner in determining and providing required information.
- 3.67 Include alphanumeric descriptor for each input and output point.
- 3.68 Program logic to perform HVAC, elevator, and door interfaces as applicable.

3.69 NEWLY INSTALLED SYSTEM / ADDITIONAL REQUIREMENTS / MAINTENANCE

- 3.69.1.1 The vendor shall conduct preventive maintenance on all equipment installed under this contract twice per year for a period of two years from date of acceptance. Maintenance shall include all of the manufacturers' suggested service, plus exercise each part of the system and control, and test each power supply and battery installed as part of this system. This shall not include any existing equipment or subsystems previously in place. Written reports shall be submitted to the school system's Safety and Communications Department stating the results of the preventive maintenance, corrective measures taken of any defects found and list of items or components replaced.
- 3.69.1.2 The vendor shall be responsible for maintaining all systems in good, efficient operating condition and shall supply all labor and parts that are necessary to repair the system during the warranty period.
- 3.69.1.3 An authorized representative of the school system will report equipment failure to the vendor during the normal workday.
- 3.69.1.4 The vendor shall dispatch one or more qualified technicians to arrive at the equipment location before close of the business day, when notification is given before noon. When notification is

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given in the afternoon before the close of business, the service call shall be made on the next business day.

3.69.1.5 The vendor's personnel shall check in at the principal's office at each school before and after performing any work.

3.69.1.6 The equipment shall be serviced and returned to full operation on the same day of the service call. In the event the equipment cannot be serviced in this time, the vendor shall notify the school system's Safety and Communications Department.

3.69.1.7 If the equipment remain out of service for longer than three business days, the vendor shall be liable for all costs incurred by the school system to provide security lost due to the failure. This may include the installation of temporary equipment, hiring another vendor to prosecute the work, or utilizing contract guard services. Each service call will be recorded, and a copy furnished to the school system for filing in a maintenance log.

3.69.2 SERVICE:

3.69.3 After normal working hours, the vendor shall have service people available to dispatch to the job site.

3.69.4 When this emergency service is required, the vendor shall respond to the call for services within four (4) hours after the call is made.

3.69.5 Emergency response must be provided without charge during the warranty period.

3.69.6 DRAWINGS AND MANUALS

3.69.6.1 Furnish six (6) complete sets of shop drawings for approval within fourteen (14) days of notification of award.

3.69.6.2 Upon completion of installation, furnish to Owner two (2) sets of "As-Built" drawings within 30 days of project completion.

3.69.6.3 One (1) master set and, for each location, one (1) complete set of operating manuals and reference manuals shall be supplied with each piece of equipment at the time of installation.

3.69.6.4 One (1) master set and, for each location, one (1) complete set of service manuals with circuit schematics, parts list, programming procedures, etc., shall be provided.

3.69.6.5 The master sets shall be provided to the Atlanta Public School System, Facilities Maintenance Department to the attention of the Director.

3.70 PRODUCT SPECIFICATION

3.70.1 In the technical section of these specifications, product name or number may identify certain products and equipment. This identification is to show the quality and standard of the equipment to be supplied.

3.70.2 When only one manufacturer or model is referenced, the absence of anything to the contrary will be interpreted as a bid on the exact item specified.

3.70.3 Where several manufacturers of models are referenced as being equally acceptable and the bidder does not indicate what particular model or brand he is bidding on, the Contract Manager shall have the right to select the brand or model referenced.

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3.70.4 The equipment specified above is the only equipment accepted due to the standardization of equipment within the school system.

3.71 CODES AND REGULATIONS

3.71.1 The fire alarm system as a whole shall comply with all applicable requirements of the current versions (at time of completion) of the National Electrical Code (NEC), the State of Georgia Building Code, all local fire, life safety codes, NFPA, BOCA, and local authorities having jurisdiction. The system shall be Underwriters Laboratories (UL) listed for Fire Alarm controls. All components for which there is a relevant UL listing shall be listed for that purpose.

3.71.2 All Georgia Life Safety 101 regulations and ADA regulations must be adhered to and applied during the installation of the equipment. It is the sole responsibility of the contractor to research such regulations.

3.71.3 At the completion of work, adjust all systems for intended function, circuiting, voltage regulation, efficiency, and leave in perfect operating condition.

3.71.4 Test all work covered under this Contract and demonstrate to the Contract Manager or other designated School system representative that all requirements have been fulfilled. Program controls for configuration data; lock/unlock times, cardholders, etc. as required by the Owner.

3.71.5 Test all wiring and connections for continuity and ground prior to installing equipment.

3.71.6 Label all wiring runs in a permanent manner and documents such labeling on the "As-Built" drawings. Labeling shall include a numeric or alphanumeric identifier specific to each individual cable, and will be machine printed. Hand written labeling is specifically not acceptable.

3.71.7 The number of splices in any wire run shall be minimized. All splices shall be made with approved crimp connectors (using the appropriate crimp tool), terminal strip, or by soldering. No twisted connections shall be used. All splices will be located in a splice box or enclosure.

3.71.8 All components will be securely mounted. No contact, sensor, communicator, control, or similar component will be mounted using adhesive products. Screws, locking washers, and bolts will be used as appropriate for the surface involved. All components exposed to public view shall be flush mounted, unless specifically approved by the Contract Manager prior to installation.

3.71.9 Any surface mounted wiring shall be in EMT conduit or "Wire mold" type surface mount channel. "Wire-mold" type channel shall be used in all office type environments, and shall be color coordinated with the wall color. All wiring will be run concealed wherever possible. Specific approval from the Contract manager is required to surface run any wiring.

3.72 STRUCTURE

3.72.1 Contractor shall include cost for all cutting and patching of any or all of his work not so indicated as work by the Owner.

3.72.2 No cutting shall be done which will reduce the structural strength of the building. Cutting will be kept to a minimum, and appropriate methods will be used to prevent unnecessary damage to surrounding surfaces.

3.72.3 Wiring passing through a firewall shall do so only in conduit, which shall be filled to the exposed surfaces with a suitable sealant.

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3.72.4 Wiring passing through a floor shall do so only in conduit, which shall be in sleeves sealed with Dow "RTV" or "Chase Foam". Sleeves shall extend 1" above the finished floor.

3.72.5 All holes in floors or solid walls will be core bored. Core boring shall be coordinated with structural members to avoid weakening the structure. Centerlines between adjacent holes shall not be less than three (3) times the diameter of the largest hole.

3.72.6 Patching, sealing and restorations of finished surfaces shall be performed only by workmen skilled in the trade necessary for restoration. The Contractor is responsible for all patching, sealing and restoration needed as a result of this work.

3.72.7 Any and all software, equipment, computer or lap top, diagnostic hardware and devices, connectors, patch cords and the like, that is needed to repair, diagnose, program or receive information history for print-out shall be furnish with the system upon completion. The Atlanta Public Schools will not accept the system until this requirement is met.

3.73 MAINTENACE OF EXISTING SYSTEMS

3.73.1 In addition to the Notifier, the Atlanta Public School system also has in operation the following Fire Alarm products: FireLite 9600, FireLite 9200, Edwards EST3, Edwards EST2, Simplex 4010, Simplex 4005 and Notifier 500.

3.73.2 These systems are to be maintained by the assigned vendor to ensure consistent and appropriate daily operations.

3.73.3 In the event the vendor determines that the existing system can no longer be properly maintained such the safety of the environment is compromised, the APS expects to receive in writing a thorough report with a recommendation for replacement.

3.73.4 The recommendation by the servicing vendor in no way guarantees the respective vendor the new work. This work will be assigned in accordance with system 6.1.6.