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**SAN FRANCISCO UNIFIED SCHOOL DISTRICT  
2011 PROPOSITION A BOND PROGRAM  
SOTA-AAS HIGH SCHOOL  
MODERNIZATION**

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**ADDENDUM NO. 1**

**Owner:** San Francisco Unified School District  
135 Van Ness Avenue  
San Francisco, CA 94103

**Date:** 20 November 2014  
**SFUSD Proj. No.:** 11522  
**DSA App. No.:** 01-114087

**Architect:** Deems Lewis McKinley  
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**PTN No.:** AAS 68478-408  
**PTN No.:** SOTA 68478-409  
**DLM Proj. No.:** 2013-0410

Notice is hereby given to all prospective bidders that plans and specifications on the subject project are modified as hereinafter set forth. This Addendum shall be attached to and form a part of the plans and specifications. All bidders must acknowledge receipt of this addendum on the Bid Form. In case of difference with previous addenda or communications, this addendum takes precedence.

It is the responsibility of all bidders to notify all subcontractors from whom they request bids and from whom they accept bids of all changes contained in this addendum.

Acknowledge receipt of this Addendum by inserting its number and date in the bidding documents. Failure to do so may subject the bidder to disqualification.

**CHANGES / ADDITIONS TO THE SPECIFICATIONS**

- AD1.01 Delete Section 13850 Fire Alarm and replace with the attached revised Section 13850 Fire Alarm.

**CHANGES / ADDITIONS TO DRAWINGS**

- AD1.02 Delete Sheet A-0.2 Sheet Index and replace with the attached Sheet A-0.2 Sheet Index marked Revision 1 and dated 11/20/14.
- AD1.03 Delete the following Fire Alarm drawings and replace with the attached drawings marked Revision 1 and dated 11/20/14.

FA0.1	Fire Alarm Cover Sheet
FA1.2	Fire Alarm Riser Diagram
FA1.2.1	Fire Alarm Riser Diagram
FA1.2.2	Fire Alarm Riser Diagram
FA1.3	Fire Alarm Calculations
FA-A2.0	Bldg A Basement Fire Alarm Plan
FA-A2.1	Bldg A First Floor Fire Alarm Plan
FA-A2.2	Bldg A First Floor Fire Alarm Plan
FA-A2.3	Bldg A Second Floor Fire Alarm Plan
FA-A2.4	Bldg A Second Floor Fire Alarm Plan
FA-A2.5	Bldg A Third Floor Fire Alarm Plan
FA-A2.6	Bldg A Third Floor Fire Alarm Plan
FA-B2.1	Bldg B First Floor Fire Alarm Plan
FA-B2.2	Bldg B Second Floor Fire Alarm Plan
FA-CF2.1	Bldg C/F First Floor Fire Alarm Plan
FA-CF2.2	Bldg C/F Upper Level Fire Alarm Plan
FA-D2.1	Bldg D First Floor Fire Alarm Plan
FA-G2.1	Bungalows Fire Alarm Plan

**ATTACHMENTS:**

SPECIFICATIONS

Section 13850 Fire Alarm System

DRAWINGS

*Large Format (42" x 30") Note: All Fire Alarm drawings, both revised and originals, are attached in this addendum as a convenience to end users. Only the sheets listed above and so marked are revised.*

A-0.2	Sheet Index (for Volume 3 of 4)
A-0.2	Sheet Index (for Volume 4 of 4) (Copy)
FA0.1	Fire Alarm Cover Sheet
FA1.1	Fire Alarm Site Plan ( <i>original</i> )
FA1.2	Fire Alarm Riser Diagram
FA1.2.1	Fire Alarm Riser Diagram
FA1.2.2	Fire Alarm Riser Diagram
FA1.3	Fire Alarm Calculations
FA1.4	Fire Alarm Details ( <i>original</i> )
FA-A2.0	Bldg A Basement Fire Alarm Plan
FA-A2.1	Bldg A First Floor Fire Alarm Plan
FA-A2.2	Bldg A First Floor Fire Alarm Plan
FA-A2.3	Bldg A Second Floor Fire Alarm Plan
FA-A2.4	Bldg A Second Floor Fire Alarm Plan
FA-A2.5	Bldg A Third Floor Fire Alarm Plan
FA-A2.6	Bldg A Third Floor Fire Alarm Plan
FA-B2.1	Bldg B First Floor Fire Alarm Plan

FA-B2.2 Bldg B Second Floor Fire Alarm Plan  
FA-CF2.1 Bldg C/F First Floor Fire Alarm Plan  
FA-CF2.2 Bldg C/F Upper Level Fire Alarm Plan  
FA-D2.1 Bldg D First Floor Fire Alarm Plan  
FA-G2.1 Bungalows Fire Alarm Plan

**END OF ADDENDUM**



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**SECTION 13850**

**FIRE ALARM SYSTEM**

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**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Work specified in this section encompasses products, assemblies and basic installation methods required for a complete and operable fire alarm system, and includes, but is not limited to:
1. New Main fire alarm control panel.
  2. Manual pull stations only at the administration office.
  3. Audible/visual devices.
  4. Smoke detectors, duct detectors and heat detectors.
  5. Monitoring of fire protection (sprinkler) flow switches, individually.
  6. Monitoring of fire protection (sprinkler) valve and tamper switches.
  7. Monitoring of main fire protection control PIV valves.
  8. Conduit and wiring system.
  9. All necessary appurtenances.

**1.2 QUALITY ASSURANCE**

- A. Each and all items of the Fire Alarm System shall be USFM listed only.
- B. Fire Protection Signaling System shall not be installed until shop drawings, including State Fire Marshal listing numbers for each component of the system have been submitted and approved by the Fire Marshal. Submit only approved drawings to the Engineer.
- C. In accordance with the standards of the SFUSD.
- D. Contractor shall coordinate with City's Department of Telecommunications and Information Services with regard to cable from the fire alarm control panel in the school to the City Master Fire Box.

**1.3 SUBMITTALS**

- A. Submit in conformance with the requirements of Section 16000 the following items:
1. Catalog data for all equipment, in manual form.
  2. Shop drawings: submit a comprehensive schematic wiring diagram identifying each system component and its relative location with respect to other components and showing the number, size, identification and types of conductors required for the interconnection of all system components.

3. Plot plans and building floor plans showing location of devices, and conduit and wire requirements.
  4. Battery and voltage drop calculations.
  5. Point-to-point diagram.
  6. Riser diagram.
- B. Record drawings and Maintenance Manuals: At completion of the work and prior to final testing, the Contractor shall turn over to the Owner two sets of the following:
1. All shop drawings, instruction sheets, control diagrams, bulletins, and all pertinent information required by the fire alarm technicians for proper operation of each and every piece of equipment furnished under this specification.
  2. Riser diagram showing all cables, junction boxes, terminal cabinets and devices, with all cable numbers indicated.
  3. As-built drawings showing all cable routing, wire markings, and color-codes for each conductor.

#### 1.4 SYSTEM DESCRIPTION

- A. General: The FACP system (Simplex) specified shall include a Digital Fire Alarm Control/Communicator, or 500 event memory logger, real time clock, calendar, test timer, cross zoning, battery charging/voltage supervision circuitry, battery lead supervision, on board diagnostics and displays, lightning/EMI protection circuits, Intelligent DCP protocol, false alarm reduction software and the associated optional modules and components for a complete FACP system. Include all manual pull stations, automatic fire detectors, speakers, flashing lights, and all wiring connections to devices, outlet boxes, junction boxes, and all other necessary material for a complete, electrically supervised multiplex style fire detections system with intelligent analog alarm initiation, to be device addressable and annunciated as described and shown on the drawings.

The Fire Alarm System shall support programmable "software" features as detailed within. The following describe the general functional requirements of the FACP system:

1. The FACP shall support the connection and reporting of alarm initiating, sprinkler supervision, and fire detection devices.
2. The FACP shall provide identification, annunciation, and communication of alarmed detectors by point and/or "grouped" zone.
3. The FACP shall be capable of segregating the points (i.e., a detector or group of detectors zoned together) into separate, independent reporting

- groups.
4. The FACP shall be expandable using hard-wired addressable identification modules.
  5. The FACP shall be capable of supporting the DCP Intelligent protocol for the purpose of communicating with analog fire alarm sensors.
  6. The FACP shall be UL listed to electrically self test itself and the analog smoke detector device connected to it.
  7. The FACP shall have electrically supervised detection loops and power supplies (mains and battery(s)). This supervision shall be programmable for the purpose of reporting this information to the DACR (Digital Alarm Communicator Receiver).
  8. The FACP shall be capable of monitoring and switching to a functional telephone line(s) when trying to establish communications with the DACR and transmitting a report.
  9. The FACP shall be capable of reporting and communicating alarm or trouble event data by reporting to one, two, or three off-site remote Digital Alarm Communicator Receivers (DACR) via dial-up analog telephone lines.
  10. The FACP shall be capable of sending (manually or automatically) test and status reports to remote DACRs.
  11. The FACP shall be programmable locally. Programming shall be accomplished via a front panel keypad or a computer.
  12. The FACP shall annunciate alarm, trouble, service reminders, and other relevant system status messages in custom English text at the Alarm Command Center (ACC).
  13. The FACP shall be capable of activating 100 relays for auxiliary functions. Relays shall be programmable to follow one or more alarm or supervisory points.
  14. The FACP shall be capable of interrogating each polling loop to determine device type by address for the purpose of self programming system response.
  15. The system shall support intelligent analog smoke detection, conventional smoke detection, manual station, water flow, supervisory, security, strobes, horn/strobes, horns, speakers, speaker/strobes and status monitoring devices.
  16. The system shall annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, signaling the need for service and eliminating unwanted alarms.
  17. The system shall provide a one person field test of either the complete system or a specified area, maintaining full functions of areas not under test.
  18. The system shall be provided with a minimum of 20% expansion space for future system upgrades.
  19. The maximum usage of loop addresses shall not exceed 85% of the loop capacity.
    - a. Devices attached to the signaling circuit shall be individually identifiable at the control panel for alarm and trouble indication. Smoke detectors shall be interrogated for sensitivity settings from

- the control panel, logged for sensitivity changes indicating the requirement for cleaning, and tested by a single technician using the panel field test routine.
- b. Sensitivity settings of individual detectors shall be automatically or manually adjustable from the control panel to reduce the incidence of false alarms caused by environmental conditions.
  - c. The analog signaling circuits shall be installed in the fire alarm control panel enclosure or in remote circuit interface panel enclosures.
20. Each address in the system shall provide for the following type of response in the system:
- a. Fire Alarm Initiation
  - b. Sprinkler System Device Supervision
  - c. Positive Alarm Sequence
  - d. Cross Zoning
21. Provide connection to City's Department of Telecommunications and Information Services. Cable to be provided by the City's Department of Telecommunications and Information Services at the contractor's expense.
- B. All peripheral devices shall be the standard product of the original manufacturer Simplex, and shall display the manufacturer's name on each component.
- C. Networking: When required for larger installations, the individual FACP can be configured to connect to other FACPs in a network configuration.
- D. Fire Alarm System shall meet the minimum requirements of NFPA Pamphlets 71 and 72, 101 Life Safety Handbook, UBC Section 809, and UFC.

## 1.5 OPERATION

- A. The system alarm operation subsequent to the alarm activation of any manual station, or automatic device, shall be as follows:
- 1. All audible alarm indicating appliances shall sound a continuous fire alarm signal/prerecorded message until silenced by the alarm silence switch at the control panel.
  - 2. All visual alarm indicating appliances (Xenon Strobes) shall display a continuous pattern until extinguished by the Alarm Silence Switch.
  - 3. Reset/Alarm Silence: Fire Alarm Control Panel shall be of the type that can silence the alarm without resetting the system.
  - 4. Supervision of fire sprinkler systems pressure, water flow and tamper switches.

5. Provisions shall be made for the immediate notification of the public fire department by telephone. The telephone line shall be equipped for direct outside dial without going through a telephone switchboard.

## 1.6 SUPERVISION

- A. System shall contain independently supervised initiation circuits so that a fault in any one zone shall not affect any other zone. The alarm activation of any initiation circuit shall not prevent the subsequent alarm operation of any other initiation circuit. Each intelligent addressable device or conventional zone of the system shall be displayed at the fire alarm control panel and remote annunciation panel by a unique alpha numeric label identifying its location.
- B. All auxiliary manual controls shall be supervised so that all switches must be returned to the normal automatic position to clear system trouble.
- C. Each independently supervised circuit shall include discrete amber "Trouble" LED to indicate disarrangement conditions per circuit.
- D. System shall be provided with sufficient battery capacity to operate the entire system upon loss of normal 120VAC power in a normal supervisory mode for a period of 60 hours with five minutes of alarm operation at the end of this period. The system shall automatically transfer to the standby batteries upon power failure. All battery charging and recharging operations shall be automatic.
- E. All circuits requiring system operation power shall be 24VDC and shall be individually fused at the control panel.

## 1.7 WARRANTY

- A. Contractor shall warrant the completed fire alarm system wiring and equipment to be free of inherent mechanical and electrical defects for a period of two (2) year (parts and labor) from the date of the completed and certified test or from the date of first beneficial use. Warranty service shall be provided by a qualified factory-trained service representative. System maintenance and repair of system or workmanship defects during the warranty period shall be provided by the Contractor free of charge (parts and labor).
- B. Manufacturer shall make available to the Owner a maintenance contract proposal to provide a minimum of two (2) inspections and tests per year in compliance with NFPA-72 guidelines.
- C. Extended service/maintenance agreements shall be offered by the Contractor for up to four years after the warranty expires. The agreement shall be renewable monthly, quarterly, or yearly

## PART 2 - PRODUCTS

### 2.1 FIRE ALARM CONTROL PANEL

- A. Fire Alarm Control Panel is located in Administration Office. All visual indicators shall be high contrast, LED type. All new Pane(s) shall be mounted with semi-flush wall trim. The new FACP system control panel is a Simplex model 4100ES, expandable to its predetermined maximum capacity of 2000 devices.
- B. Control panel shall contain the following features:
1. Initiation Device Circuits
  2. Alarm Indication Appliance Circuit
  3. Supervised Annunciator Circuits
  4. Remote Station Module
  5. 2 Form C Alarm Contacts (2.0 Amps ea.)
  6. From C Trouble Contact (2.0 Amps ea.)
  7. Earth Group Supervision Circuit
  8. Basic 5 Amp Power Supply
  9. Automatic Battery Charger
  10. Standby Batteries
- C. Zones: The Fire Alarm Control Panel shall have separate alarm zones for all detection circuits for the buildings, fire damper smoke detectors, area smoke detectors, heat detectors, including manual alarms, and sprinkler flow zones.
- D. All products to be by Simplex unless approved by the San Francisco Unified School District.

### 2.2 PERIPHERAL DEVICES

- A. Manual stations shall be addressable, type single action and shall be constructed of high impact, red Lexan with raised white lettering and a smooth high gloss finish. The break glass rod station shall have a hinged front with key lock. Stations that utilize screwdrivers, Allen wrenches, or other commonly available tools shall not be accepted. Stations shall be keyed alike with the fire alarm control panel. When the station is operated, the handle shall lock in a protruding manner to facilitate quick visual identification of the activated station. Provide Safety Technology International (STI) or approved pull station clear convex covers to protect against physical damage and false triggering. Covers to be clearly labeled. Do not provide local audible alarm with battery back-up.
- B. Automatic initiating appliances:
1. Photoelectric smoke detectors
  2. Heat Detectors
  3. Duct Smoke Detectors

- C. Audio/Visual Alarm Indicating Appliances:
  - 1. Strobes shall operate at 24VDC, and strobe candela rating shall be as indicated on plans in accordance with CUBC, ADA and NFPA. Strobes in same room shall be synchronized-operation in accordance with CUBC and UFC.
  - 2. Horns, flush mounted with grille, 96dBA at 10 feet, 24VDC. Where located on exterior of buildings, horns shall be of waterproof construction.
  - 3. Mini-horns, flush mounted, 85-90dBA at 10 feet, 24VDC, shall be shall provided for reduced sound levels in small rooms, such as restrooms, offices, and conference rooms.
  - 4. Water flow alarm bells, 120VAC with protective cover, waterproof construction, for sprinkler water flow alarm.
  - 5. Devices located in restrooms or gymnasiums shall be provided with wired guards.
  - 6. Speakers shall be spaced for intelligibility.
- D. All outdoor, peripheral devices shall be listed for exterior usage.
- E. Addressable Zone Adapter Modules: mounted on 4 square outlet box.
- F. Addressable Zone Control Relay: with dry contacts to switch loads, for fire dampers and HVAC unit shutdown.
- G. Magnetic Door Holders: 24VDC of suitable design to suit doors. Refer to Architectural door finish schedules. Doors shall be released during fire emergency.

### 2.3 WIRING

- A. Signaling Line Circuits: Twisted shielded pair No. 18 AWG.
- B. Strobe/Horn: Minimum No. 14 AWG solid THHN-THWN, or larger, determined from voltage drop calculations.
- C. Speaker: Minimum No. 14 AWG solid THHN-THWN, or larger, determined from voltage drop calculations.
- D. Interconnection Circuit: Unshielded twisted pair No. 18 AWG minimum, UL listed for direct burial, with water blocked construction, moisture resistance PVC jacket. For wire colors for the various devices, they must comply with the requirements of the SFUSD standards.

## 2.4 FIRE ALARM SYSTEM POWER SUPPLIES:

### A. System primary power

1. Primary power for the FACP and the secondary power battery chargers shall each be obtained from the power panel board. Circuit breakers shall be fitted with a suitable guard, requiring removal of a screw to open, and used only for fire alarm.
2. The power supply and battery charging shall be provided by the power supply interface board and power supply module.
3. A fusible double throw AC power disconnect switch, lockable in the open and closed positions shall be provided adjacent to the Fire Alarm Control Panel.

### B. Secondary power supply

1. Provide sealed gelled electrolyte batteries as the secondary power supply for the fire alarm control panel and each system circuit interface panel. The battery supply shall be calculated to operate its load in a supervisory mode for 24 hours with no primary power applied and, after that time, operate its alarm mode for five minutes.
2. Provide battery charging circuitry for each standby battery bank in the system low voltage power supply or as a separate circuit. The charger shall be automatic in design, adjusting the charge rate to the condition of the batteries. Battery charge rate and terminal voltage shall be read using the fire alarm control panel LCD display in the service mode, indicating directly in volts and amps.

## 2.5 SAFELINC INTERNET MODULE:

Furnish as a part of the installed system, a 4100-6060 SAFELINC INTERNET MODULE. Furnish and install (2) CAT5 cables from main FACP to designated MDF/IDF location as depicted on drawings.

## 2.6 EVACUATION SIGNAL:

### A. Furnish and install where shown on the drawings, audible and /or visual signals, Simplex type audio visual devices with the following characteristic and capacities:

1. Electronic horn or speakers with a sound rating of 90 dba and temporal pattern per code, and a strobe light with an intensity of 15, 75, and 110 candela (where required) Provide and install factory-manufactured red-painted steel wireguard to protect unit(s) in boys and girls bathrooms, auditoriums, gymnasiums, locker rooms, and areas subject to vandalism, mount exterior horns in weather proof enclosures.

2. Visual alarm signals model 15, 75 and 110 series shall be furnished with minimum light intensity of 15, 75, and 110 candela complying with the ADA act and the following requirements:
  - a. Xenon strobe with a minimum repetition rate of 1HZ, not exceeding 2 HZ and maximum duty cycle of 40% with pulse duration of .2 seconds.
  - b. Provide factory-made re-painted steel wire-guard to protect strobe.
3. If more than one strobe in one room or area, all strobes shall be synchronized.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Provide and install the system in accordance with the Plans and Specifications, all applicable codes and the Manufacturer's recommendations.
  1. All wiring shall be installed in strict compliance with all the provisions of NEC - Article 760 A and C, Power-Limited Fire Protective Signaling Circuits, or may be reclassified as non-power limited and wired in accordance with NEC-Article 760 A and B. Upon completion, the Contractor shall so certify in writing to the Owner and General Contractor.
  2. All wiring shall be in conduit.
  3. All junction boxes covers where located above suspended ceiling, or where exposed in stage or technical catwalk areas shall be sprayed red. Wiring color code shall be maintained throughout the installation.
- B. Programming: Programming of the system shall include the following tasks:
  1. Programming system configuration parameters (hardware and software, zone/circuit numbers, communications parameters).
  2. Programming operational parameters such system response text (custom English) displays of events, activation of relays that drive auxiliary devices, and identifying types of zones/loops.
  3. Other system programming tasks required by the owner. These additional programming requirements shall be coordinated between the owner and the contractor.
- C. Installation of equipment and devices that pertain to other work in the Contract shall be closely coordinated with the appropriate Subcontractors.

- D. Contractor shall clean all dirt and debris from the inside and the outside of the fire alarm equipment after completion of the installation.
- E. Manufacturer's authorized representative shall provide onsite supervision of installation.

### 3.2 CONDUCTORS:

- A. Design and provide number conductors and AWG sizes between devices, control panel, annunciation panels and all detached fire alarm equipment.
- B. Each conductor shall be identified as shown on the drawing at each with wire markers at every splice and terminal point. Attach permanent wire markers within 2 inches of the wire termination. Marker legends shall be visible.
  - 1. All wiring shall be supplied and installed in compliance with the requirements of the National Electric Code, NFPA 70, Article 760, and that of the manufacturer.
  - 2. All splices shall be made using solder less connectors. All connectors shall be installed in conformance with the manufacturer recommendations.
  - 3. Crimp-on type spade lugs shall be used for terminations of stranded conductors to binder screw or stud type terminals. Spade lugs shall have upset legs and insulation sleeves sized for the conductors.
- C. Permanently label or mark each conductor at both ends with permanent alphanumeric wire markers.
- D. Utilize the SFUSD standard color-code for fire alarm system conductors throughout the installation.
  - 1. The installation contractor shall submit for approval prior to installation of wire, a proposed color code for system conductors to allow rapid identification of circuit types, per School District standard.
- E. Wiring within sub panels shall be arranged and routed to allow accessibility to equipment for adjustment and maintenance.

### 3.2 TESTING

- A. Completed fire alarm system shall be fully tested in accordance with applicable State Codes, and NFPA 72, by Contractor in the presence of the Owner's Representative and the State Fire Marshal.

- B. Hard-copy System Printout:  
The contractor shall submit a hard-copy system printout of all components tested and certify 100 percent operation indicating all devices/panels/units have passed the test criteria set forth by the manufacturer.
  
- C. An acceptance test plan form shall be prepared / provided by the contractor prior to the acceptance walk-through. This form shall include separate sections for each device/panel/unit as well as a column indicating the manufacturer's performance allowance/margin, a column indicating the result of the testing performed by the contractor (pass/fail), and an empty column for recording findings during the walk-through.
  
- D. Upon completion of a successful test, Contractor shall so certify in writing to the Owner and General Contractor.

END OF SECTION

05/01/14  
Rev. 11/20/14

