

NATHAN CLIFFORD SCHOOL REDEVELOPMENT – PORTLAND, MAINE

SECTION 16721

FIRE ALARM AND SMOKE DETECTION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section of the specification includes the furnishing, installation, and connection of a “house” fire alarm system consisting of a microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete coordinated system ready for operation. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control panel, auxiliary control devices, annunciators, and wiring as shown on the drawings and specified herein.
- B. This section of the specification also includes furnishing, installation and connection of “local” fire alarm detection/notification means within individual living units. Local fire alarm means shall include, but not be limited to, alarm initiating devices, alarm notification appliances and wiring as shown on the Drawings and specified herein.
- C. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for protected premises signaling systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.
- D. This section also requires a connection to an off-site monitoring agency for reporting a “house” alarm condition.

1.2 RELATED SECTIONS

- A. Section 16180 – Equipment Wiring Systems.

1.3 “HOUSE” FIRE ALARM SCOPE

- A. A new intelligent reporting, microprocessor controlled fire detection system shall be installed in accordance to the project specifications and drawings.
- B. Basic Performance:
 - 1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on an NFPA Style 7 (Class A) Signaling Line Circuit (SLC).
 - 2. Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D).
 - 3. Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z).
 - 4. Digitized electronic signals shall employ check digits or multiple polling.
- C. A single ground or open on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

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- D. Alarm signals arriving at the main FACP shall not be lost following a power failure (or outage) until the alarm signal is processed and recorded.
- E. Interlock the “House” fire alarm system with the elevator operation as described in Section 16180.
- F. Interlock the “House” fire alarm system with the elevator shaft relief vent as described in Section 16180.

1.4 COORDINATION WITH CITY OF PORTLAND FIRE PREVENTION BUREAU

A. Fire Alarm Permit

1. The Contractor shall be responsible for obtaining a fire alarm permit from the City of Portland. A city fire alarm permit application and permit fee shall be submitted by the Contractor prior to purchase of any fire alarm equipment.
2. The following will be provided by the Engineer in support of the fire alarm permit:
 - a. Electronic PDF files of floor plans showing fire alarm system components (11x17 and full-size copies).
 - b. Input/output matrix.
 - c. Designer qualifications.
3. The following shall be provided by the Contractor in support of the fire alarm permit:
 - a. Wiring diagram from the system manufacturer.
 - b. Annunciator details from the system manufacturer.
 - c. Equipment data sheets from the system manufacturer.
 - d. Battery and voltage drop calculations.

B. Fundamentals

1. All fire alarm system components, wiring, and operation shall conform to all requirements contained in the City of Portland Standard for Signaling Systems for the Protection of Life and Property 2012 Edition.
2. All control equipment must have transient protection devices to comply with UL864 requirements.
3. Knox Box(s) – number, make, and model shall be provided as determined by the Fire Prevention Bureau, and shall be located as required by the Fire Department. All keys required to operate the life safety signaling system shall be placed within the box.
4. Personnel Qualifications
 - a. System Installers and Service Personnel
 - (1) Life safety signaling system installers and service personnel shall be Maine licensed electricians.
 - (2) Life safety signaling system installers and service personnel shall have completed an approved training program in accordance with *NFPA 72*.
 - b. Certificate of Fitness
 - (1) Companies engaged in the installation or servicing of life safety signaling system shall have a Certificate of Fitness.
 - (2) Certificates of Fitness shall comply with *NFPA 1*.
5. A fire alarm records cabinet shall be provided next to the Signal System Interface Panel. The cabinet shall be keyed alike, and labeled “FIRE ALARM DOCUMENTS”. With the exception of *NFPA 72* Section 72:14.6.3, it shall contain all records listed in *NFPA 72*

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4. Master box equipment shall be of the type approved by the Fire Chief.
5. Installation shall be per manufacturer and City requirements.
6. Master box equipment shall be located next to the signal system interface panel and shall not be capable of operation apart from the building signal system.
7. Each master box alarm number shall not serve more than 100,000 square feet of building space, more than one building, more than one evacuation zone, or more than 6 stories.
8. All wiring on the municipal side of the signal system interface panel shall be rigid conduit.

F. Initiation Devices

1. Initiation devices shall be labeled with a unique identity number visible from the floor for tracking of maintenance. All such labeling shall be completed in the time frame established by *NFPA 72* for which each device of the given type must have been tested

1.5 "HOUSE" FIRE ALARM SYSTEM FUNCTIONAL OPERATION

A. When a fire alarm condition is detected and reported by one of the system initiating devices located in common areas, the following functions shall immediately occur:

1. The system alarm LED shall flash.
2. A local piezo electric signal in the control panel shall sound.
3. A backlit 80-character LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
4. Printing and history storage equipment shall log the information associated each new fire alarm control panel condition, along with time and date of occurrence.
5. All system output programs assigned via control-by-event equations to be activated by the particular point in alarm shall be executed and the associated system outputs (alarm Notification appliances and/or relays) shall be activated.
6. Audible and visual alarm notification appliances throughout the facility (including those in Living Units) shall activate.

1.6 "LOCAL" FIRE ALARM SCOPE

A. Multiple-station, hard-wired unitary equipment conforming to *NFPA 72* shall be provided for all living units and shall be installed in accordance with the project specifications and Drawings.

B. Basic Performance:

1. Living Units : Actuation of any automatic fire alarm initiating device causes all local audible and visual alarms to activate within the given unit.

1.7 SUBMITTALS

A. General:

1. Submit shop drawings and product data under provisions of Division 1 and Section 16010.