SECTION 16721D - FIRE ALARM SYSTEMS

A. General Provisions: Design a complete system, including controls, stations, speakers, heat detectors, smoke detectors, flow switches, door releases, and any other devices that are electrically a part of the system. All components of the system shall be of an approved type and shall be installed in accordance with the provisions of the latest revisions of the Ohio Basic Building code and all Referenced Standards (NFPA 72) accepted by the OBBC listed in Appendix A and ADA (American Disability Act). Each piece of equipment shall be approved and carry an Underwriter’s Laboratory label. Each control panel shall have zone (if under 25 total devices in the building) or point (if over 25 devices) alarm and trouble location provided at both the control panel and the University Central Station. System must be UL listed for use with the University wide fire alarm system (Simplex 4120).

Acceptance by the University: Specify that the system shall be demonstrated in the presence of the University Architect Project Manager in conjunction with the Department of Public Safety (Technical Services Unit and Industrial Health & Safety Fire Inspector), State of Ohio fire/building representative(s). The system will not be accepted until all components are determined to be operating properly with the University of Cincinnati’s campus wide fire alarm monitoring system. The system shall report alarm and trouble signals by zone (if under 25 devices) or point (if over 25 devices).

B. TYPE AND FUNCTIONS: System shall be non-coded, continuous ringing type.

1. Wiring and devices shall be under constant electrical supervision. An open or ground in any wire shall cause a trouble signal to operate at the building panel. The trouble signal shall also operate on loss of supervisory power. The system shall be supervised, and all trouble signals will report to the University Central Station.

2. Provisions for silencing the trouble signals shall be included on the control panel. The trouble signal shall sound until manually silenced, or the trouble condition is corrected.

3. Pull Stations shall be surface mounted or semi-flush mounted as conditions dictate. Pull stations shall be red in color and shall be push-pull double action, and fully addressable on systems larger than 25 devices.
   a. Pull stations shall be of the Push/Pull Double Action type, and require that two actions be taken to activate the pull station. Simplex type 2099-9761.
   b. Pull Station trim plate to be used when the station is installed in a semi-flush manner, type 2099-9813.
   c. Pull Station trim plate to be used when the station is installed with a surface Wiremold box, type 2099-9814.
   d. Pull Station surface back box, type 2975-9178.
   e. Pull stations in locations exposed to weather or high levels of moisture under normal conditions shall be protected with an appropriate weather cover, UL listed for the purpose. Pull stations located in parking structures specifically are included. Type, STI Weather Stopper II, or equivalent.
f. Pull stations in Residence Life housing, or otherwise in high risk locations for false alarms shall be protected with an appropriate false alarm deterrence cover, UL listed for the purpose. This cover shall provide a local audible alarm when lifted, and shall be powered by a standard 9 volt alkaline battery. Type STI Stopper II, or equivalent.

4. Alarm Indicating Devices shall be speakers and strobes. Speakers shall be located so that their operation will be heard clearly in all areas regardless of the ambient noise level. Speakers shall provide a sound pressure of 15 dBA above the average ambient sound level in every occupied space in the building. Particular attention shall be paid to areas which are subject to high ambient sound levels as a normal part of their operation (arenas, auditoriums, recreational areas, etc.) and the system designed to provide adequate warning under all normal operating conditions. The minimum sound pressure shall be seventy (70) dBA in buildings of Use Group R and I-1, ninety (90) dBA in mechanical equipment rooms, and sixty (60) in all other use groups. The maximum dBA shall be not more than 115 dBA (OSHA Regulation) for audible alarm indicating devices).

Speaker/strobe units designed for exterior use shall be located outside each main entrance that may serve as a congregation area for persons evacuating the building during an emergency. If the building interconnects with other buildings, visual alarm indicating devices shall be placed outside each connecting door to prevent inadvertent entry into the building during an emergency.

The system shall be capable of voice communication via site microphone from the main fire alarm panel, and from the annunciator panel (if used). The system shall be capable of voice communication from the University Central Station.

Visual indicating devices shall be provided to meet current NFPA and ADA standards. The system shall be designed to allow for expansion of additional audio/visual indicating devices and circuits in public areas without a major upgrading of the electrical or wiring components in order to comply with changing ADA requirements. At a minimum, a separate audio and visual circuit shall be run for each floor.

a. The standard audible shall be a 4” speaker, adjustable from 1.4 Watt to 2 Watts that can be installed by itself or in conjunction with a visual strobe, type 2902-9732.
b. The high output audible shall be a 4” speaker, adjustable from 2 Watts to 15 Watts that can be installed by itself or in conjunction with a visual strobe, type 2902-9713.
c. The visual strobe base to be used with a speaker shall be a type 4903-9501.
d. The visual strobe base to be used when a stand alone visual signal is required shall be a type 4904-9501.
e. Xenon visual strobe to be used shall be type 4904-9106.
f. Audio/visual units located in Residence Life housing areas, or in other areas where there is a high risk of physical damage (gymnasiums, etc.) shall have a protective wire housing UL listed for the purpose installed over the device.
5. Magnetic Door Holders shall be of the 120VAC type, used in conjunction with Simplex True Alarm Smoke Sensors. Smoke check door closer type devices shall not be used.

6. All wiring shall be run in conduit. Metal raceway (Wiremold type) may be used in exposed locations.

C. ADDITIONAL COMPONENTS

1. Control unit shall be installed in a suitable steel cabinet with hinged cover, secured with lock and key. The control panel shall be a 4120-8201 or 4120-8210 type with audio voice capability, and shall include:

   a. Line terminals for 120/208 volt single phase power.
   b. The secondary power supply shall be provided from an emergency electrical system that conforms to Section 2706.0 (OBBC) and appropriate NFPA codes, and shall be capable of operating the system under maximum normal load for 24 hours and then be capable of fifteen minutes operation in full evacuation mode.
   c. Reset switch, password protected.
   d. Signal silence switch, password protected.
   e. Signal selection and bypass switches, password protected.
   f. Modules as necessary, including:
      - 4120-7003 Master Controller
      - 4120-6012 Modular Network Interface Module
      - 4120-0142 RS0485 Media Card (wire)
      - 4120-0143 Fiber Optic Media Module
      - 4120-4321 Notification Appliance Circuit Module
      - 4120-3001 4-DPDT Auxiliary Relay Module
      - 4120-0108 Expansion Power Supply
      - 4120-0110 Magnet Addressable Module
      - 4120-0112 Dual RS232/2120 Comm. Module
      - 4120-0210 Single Channel Audio Controller
      - 4120-0203 100 Watt Amplifier
      - 4120-0204 Microphone and Enclosure
      - 4120-0220 Standard Evacuation Message
      - 4120-0403 Speaker Selector Switch Module
      - 4120-0405 AHU hand off auto switch module
      - 4120-2003 6 Unit Package with Glass Door

   The quantity of these modules will be determined based upon the individual needs of each building, other modules may also be added to meet the needs of a particular building.

   d. Locate the control panel in the lobby area of the building for Fire Department access. The use of a separate Fire Control Roof off of the main lobby area is acceptable provided that it is dedicated to that purpose. If there is not sufficient
space in the lobby for the control panel, locate a remote annunciator panel in the lobby. This remote annunciator panel shall consist of:
4120-0450 Remote LCD Display
4120-0410 Remote Microphone and Enclosure
4120-0403 Speaker Selector Switch Module
4120-2002 4 Unit Package with Glass Door

2. The exact location of the control panel and/or annunciator shall be coordinated with the Department of Public Safety (Technical Services Unit) by the Associate. Multiple annunciator locations may be required for large complexes, or buildings with multiple main entrances.

3. Smoke Detection Systems shall comply with NFPA 72E requirements for smoke detection. Smoke detection devices in any one building shall be of one manufacture and shall be connected as a part of the fire alarm system. Smoke detectors shall be addressable with adjustable sensitivity (from the control panel). The fire alarm system shall include relays for output signals to shut down fans, close dampers, and operate door releases, where required, as a result of smoke detector operation. The activated detectors shall be designed to lock in until manually reset from the control panel. These smoke detectors shall be:
   a. True Alarm Smoke Sensor, type 4098-9701.
   b. True Alarm Smoke Sensor Base, type 4098-9781.
   c. True Alarm Smoke Sensor Base with Relay, used in conjunction with the 4098-9701 Smoke Sensor when a programmable relay would be needed, such as to release door holders, type 4098-9783.
   d. True Alarm Duct Smoke Sensor, type 4098-9703.

Smoke detectors located in Residence life housing areas, or in other areas where there is a high risk of physical damage (gymnasiums, etc.) shall have a protective wire housing UL listed for the purpose installed over the device. Type, STI-9601 or equivalent.

4. Water Flow Alarms, Sprinkler Tampers, and other Sprinkler Supervisory switches shall comply with NFPA 72, 101, and other appropriate NFPA codes regarding the installation, locations and sensitivity of flow alarms and sprinkler supervision. All such switches shall provide specific point annunciation.

5. Monitor ZAM shall be used to provide a dry contact activation of a function such as AHU shutdown, type 2190-9163.

6. Heat Detectors shall be of the combination rate of rise, fixed heat type, unless environmental conditions require a fixed heat type. The detectors shall be rated properly for the prevalent environmental conditions at the installed location. They shall be tied into the fire alarm system, and shall be installed to comply with all requirements of NFPA 72, and other applicable code. Heat detectors located in Residence Life housing area, or in other area where there is a high risk of physical damage (gymnasiums, etc.) shall have a
protective wire housing UL listed for the purpose installed over the device. Type, STI-9601 or equivalent.

7. **Alarm Signals:** Unless otherwise specifically approved by the Department of Public Safety, all buildings will be designed for full evacuation on any fire alarm. The standard alarm signal shall be the slow whoop siren with UC standard voice message, except in University Hospital, which shall use the hospital standard. The standard weather alert signal shall be the high/low siren.

8. **Access to the fire control functions shall be protected by passwords, and shall be controlled as follows:**

<table>
<thead>
<tr>
<th>Function</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Silence</td>
<td>2</td>
</tr>
<tr>
<td>System Reset</td>
<td>2</td>
</tr>
<tr>
<td>Set Time and Date</td>
<td>3</td>
</tr>
<tr>
<td>Control Key 1 (Campus bypass)</td>
<td>3</td>
</tr>
<tr>
<td>Control Key 2 (Elevator bypass)</td>
<td>3</td>
</tr>
<tr>
<td>Control Key 3</td>
<td>3</td>
</tr>
<tr>
<td>Control Key 4 (Weather Alert)</td>
<td>1</td>
</tr>
<tr>
<td>Control Key 5 (ORL room smoke reset)</td>
<td>1</td>
</tr>
<tr>
<td>Enable/Disable Points</td>
<td>4</td>
</tr>
<tr>
<td>On/Off/Auto</td>
<td>3</td>
</tr>
<tr>
<td>Clear Trouble Log</td>
<td>4</td>
</tr>
<tr>
<td>Clear Alarm Log</td>
<td>4</td>
</tr>
<tr>
<td>Walk Test</td>
<td>3</td>
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<tr>
<td>Clear Alarm Verification Tally</td>
<td>3</td>
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</tbody>
</table>

Passwords will be programmed as defined by the Department of Public Safety (Technical Services Manager).

9. **Spare parts shall be provided in the amount recommended by the system manufacturer. Spare parts shall be turned over to the Department of Public Safety, Technical Services Manager.**

10. **Keys for all pull boxes, control cabinets, and other system components which are locked shall be turned over to the Department of Public Safety, Technical Services Manager.**

D. **FIRE DEPARTMENT ACCESS:** The Associate shall meet with the Department of Public Safety (Fire Prevention Unit) for review of the Fire Department access and any necessary coronation with the Fire Department prior to final plan approval.

E. **DRAWINGS AND SUBMITTALS:** The following shall be submitted to the University, and turned over the Department of Public Safety (Technical Services Unit):

1. Typical layout of all wall mounted equipment, either flush or recessed, accurately dimensioned. Each possible method of installation shall be illustrated. Three sets.
2. Schematics and wiring diagrams showing all interconnection wiring. Three sets.
3. A single line drawing showing the physical location of each device, it’s system address, and the type of device. A single line riser diagram of the system. Complete list of points on systems, and all programming data for panel. Three sets.
4. Layout of all equipment as it will be installed in the control panel(s). Three sets.
5. Bill of material of all equipment. Three sets.
6. Detail description of system operation as it will be installed, with only those features included that are used. Three sets.
7. Reduced size (8.5” x 11”) laminated single line drawing(s) on multiple sheets if necessary to preserve legibility, and list of points, as described in E.3 One set in three ring binder, permanently labeled with the building name. The be placed in key and drawing cabinet.
8. Autocad compatible (.DWG) files of all drawings, point list file, and panel programming description, on IBM compatible 3.5” high density disks, or other media acceptable to the University. Two sets.
9. Service manuals for all components of the system. In three ring binders, three sets.
10. General catalog sheets shall not be submitted in lieu of shop drawings. When illustrative of a series of products or variations of products, the one model or type intended to be used shall be clearly highlighted, and all non-pertinent description shall be crossed out.

F. DEVICE IDENTIFICATION: Install address plates on all addressable components, indicating the address of the device. Labels to be a permanent type, 36 point height black letter on white tape, with clear laminate overlay. Hand lettering is specifically not acceptable.

G. WIRING AND BOX COLOR CODES: All wiring and boxes shall be color coded as specified in NFfPA 72 and the National Electrical Code. All pull and junction boxes will specifically be painted red.

H. FIREMAN COMMUNICATION: The University has a fireman’s radio communication system installed on the three campuses located in the City of Cincinnati. This system shall be utilized whenever a Fireman’s Communication System is required in the City of Cincinnati. The Associate is responsible to coordinate the incorporation of new building into this system, including pre-planning with the Department of Public Safety (Technical Services Unit). Prior to acceptance, the new system must be tested and certified by the Department of Public Safety (Technical Services Unit) and the City of Cincinnati Fire Department.

I. ELEVATOR RECALL: Elevator recall shall be provided where required, by system smoke detectors connected to the building fire alarm system. Elevator recall shall be installed in accordance with the OBBC Elevator Code, and all other applicable codes. Elevator recall detectors shall be addressable analog photoelectric smoke detectors with relay base.

J. DUCT SMOKE DETECTION: Duct smoke detection shall be provided where required by addressable, analog duct smoke detectors connected to the building fire alarm system. Duct smoke detectors shall not be used to replace area smoke detection, and are not to be used as life safety devices. their primary purpose shall be to shut down air handling equipment in order to prevent or control the spread of smoke through the building. Duct detectors shall be installed in accordance with NFfPA 72 and all other applicable codes.
K. KEY AND DRAWING CABINET: Provide a cabinet for storage of system documents and keys next to the fire alarm control or annunciator in the building lobby. Cabinet to be 14.5”W x 18”H x 7”D, constructed of 11 ga plate steel, with full length welded hinge, and two Medeco locks, either of which can open the cabinet. One lock shall be keyed alike to the University standard, the other to the appropriate Fire Department standard (contact the Department of Public Safety Technical services Unit for details). Locks to be supplied with ten (10) numbered tamper seals. Cabinet to be provided with a tamper switch that activates a supervisory point on the fire alarm system when the cabinet is opened. This supervisory point shall communicate to the University Central Station.

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