Design Guidelines-Fire Alarm / Mass Notification Systems

GENERAL

- BASIC REQUIREMENT FOR INSTALLATION: All new buildings, and existing buildings undergoing major renovations, shall be equipped with a complete voice evacuation fire alarm system which meets Florida Building and Florida Fire Prevention Codes. Contractors shall provide all hardware necessary to interface with the existing campus monitoring system.

- COORDINATION:

    o Coordinate all installations with EH&S Fire Safety Section or the local campus facilities director.

    o To ensure compatibility, the EH&S Fire Safety supervisor or local campus facilities director shall be informed of and approve of the proposed type of fire alarm control panel during the project design phase.

- LICENSING: All work on fire alarm systems shall be performed by an individual, or firm, licensed as an "Alarm System Contractor I" as required by Florida Statute 489.505(a), other parts of said Statute, and complies with all other licensing requirements of relevant codes and laws. Further, this individual or firm shall be either the prime constructor on such work or a subcontractor to the prime constructor.

- PERMITTING: All fire alarm work that is done as a part of a project and/or by a contractor shall be permitted through the Florida State University Building Code office.

EQUIPMENT (Fire Alarm System / Mass Notification)

Fire Alarm System Control Panels

- Fire Control Panel: Contractors shall provide a programmable central fire control panel with addressable field devices and voice evacuation capabilities. The fire control panel shall meet NFPA 72 detector sensitivity readout/printout requirements. A history of a minimum of 200 events shall be readable on the fire alarm control panel display (200 events for alarm and 200 events for trouble). All new Siemens fire alarm systems installed shall have a TSP 4-A printer in the fire alarm control panel or other approved means by FSU Fire Safety.

- Annunciator Panel: Annunciator panels shall be located where the fire department will enter the building and be approved by the fire service provider. The annunciator panel shall duplicate all functions of the fire control panel.

- Renovations: When the existing fire alarm control panel does not support the type of renovation being performed in a building, a second (or third) fire alarm control panel shall be installed. The fire alarm control panels installed for the renovation shall be of sufficient capacity to handle the entire building when the existing fire system(s) is (are) changed.

- Mass Notification: A mass notification control panel shall be installed in all new construction and existing system upgrades that support voice notification. New mass notification panels shall functionally integrate with existing mass notification equipment.

Acceptable Manufacturers:

- Equipment should be compatible with the existing equipment on the campus to ensure appropriate equipment interface.

- Fire alarm equipment on Tallahassee campuses shall be Simplex 4100ES, 4010ES, or Siemens XLS.

- Fire alarm equipment on other FSU campuses shall be of the same manufacturer as existing campus equipment and fully integrate with existing systems.

- Mass notification equipment shall be "American Signal" and fully integrate with campus wide systems.

Fire Alarm System Initiating Devices

- PULL STATIONS: Pull stations shall be single action type. In Housing buildings, the pull stations shall be equipped with a protective tamper shield. The protective tamper shield shall be a clear Lexan cover that emits a loud piercing noise when disturbed. The cover shall be battery powered and shall silence itself by lowering and realigning the shield. Stopper II, as manufactured by Safety Technology International, Inc. (STI), are acceptable covers. Protective shields shall only be used to protect pull stations from the elements or in locations where vandalism is likely (such as next to exterior exits). They are not required throughout the interior of a building.

- DUCT-MOUNTED SMOKE DETECTORS: Duct-mounted detectors shall be mounted in a readily accessible location. If duct-mounted smoke detectors are not immediately visible from inside the mechanical room, then provide a remote, labeled L.E.D. indicator for each detector mounted in a convenient visible location. Duct detectors shall be of the photoelectric type and programmed as a supervisory unless otherwise specified by the Engineer of Record or FSU Fire Safety. If a stand-alone duct-mounted smoke detector is installed where there is no fire alarm system present, the detector shall shut down the AHU and provide notification.

- **Tallahassee Campus** -CARBON MONOXIDE (CO) DETECTORS: Carbon Monoxide (CO) detectors shall send separate signals to the Keltron system via fire panel.

- COMBINATION SMOKE, HEAT, CO DETECTORS: Combination Smoke, Heat, CO devices shall be installed in accordance with NFPA 72.

FA system Notification Appliances

- All Notification Appliance circuits shall be synchronized.

- All Notification Appliances shall have an adjustable candela.

- All Notification Appliances shall be assessed for synchronization prior to any project that involves fire alarm work. If the existing system is not synchronized, a determination by EH&S personnel shall be made whether or not synchronization will be required for that project.

Monitoring

- CAMPUS MONITORING SYSTEM INTERFACE**:** Equipment shall be able to interface with the existing campus monitoring equipment.

- **Tallahassee Campus** - A Keltron Radio Alarm Communicator Transmitter shall be installed on all new projects and specified existing projects for reporting to the University Police. Consult EH&S Fire Safety Section regarding the manufacturer and model required. The project shall provide and program the communicator as directed by the EH&S Fire Safety Section.

EXECUTION/INSTALLATION

General

- All equipment shall be installed as to provide adequate access for service and repair. All new wiring shall be installed in conduit unless approved by the EH&S Fire Safety Section or local facilities director.

- On retrofit projects that involve adding to existing wiring, the Constructor shall exactly match the colors of the new wiring with the existing.

- The Constructor shall certify and tag the system after all modifications are made and prior to Substantial Completion.

- The Constructor and the EH&S Fire Safety Section shall test the fire alarm system before any renovation or modification is made. Any part of the system not working properly shall be noted or repaired before any construction begins.

- **Tallahassee Campus**: All wiring shall be Class B and the fire alarm conductors shall be color coded as follows:

    o Horns: Red +, Black -

    o Strobes: (if separate) Yellow + Brown

    o A/C Ventilation Shut Down: Purple + White

    o Magnetic Doors: Purple + White

    o 24 Volt Circuits: Pink + Gray

    o Data line wiring shall be twisted shielded 18 gauge FPLP wire in a red jacket. All data wire shall meet current code requirements and manufacturer's specifications. Speaker wiring shall meet current code requirements and manufacturer's specifications and have a different color jacket than the data wiring (minimum 18 gauge twisted shielded).

- On renovations, always remove existing wiring and install new, properly color-coded wiring.

- On renovations, in addition to the renovation prints and/or drawings, the existing prints are to be updated to include any changes.

- Audible visual appliances shall be provided in machine rooms and loft/attic areas that have mechanical equipment or work areas.

- All connections shall be made on terminal strips. There shall be no more than two conductors under one connection. Wires on these terminals shall be labeled.

- Programming of the fire alarm shall be as specified by the University. Consult with EH&S Fire Safety Section or the local facilities director concerning the requirements. University specific programming includes, but is not limited to: function keys and any other label changes and site-specific programming.

- All fire and smoke alarm sensors shall be resettable.

- Surge protection shall be installed on all fire panels and field wiring leaving and entering the building.

Labeling

- ADDRESSABLE DEVICES: All addressable devices shall be clearly marked with a printed label indicating its address.

- NOTIFICATION APPLIANCE: All end of line notification appliances shall be clearly marked with a printed label indicating it is the end of line device.

- TERMINAL CABINETS: All terminal cabinets shall have all circuits clearly marked on what that circuit controls.

- FIRE PANELS: All fire panels shall have the breaker location marked on the inside of the panel door.

- BATTERIES: All batteries shall have their install date clearly marked on the battery.

- CONDUIT: All fire alarm conduit shall be marked every 10 feet in red.

- JUNCTION BOXES: All fire alarm junction boxes shall be identified in red.

Operation

- AIR HANDLING UNITS: Actuation of any fire alarm initiating device shall cause all air handlers in the building area affected to shut down. Air handling units shall shut down only in the area where the fire is detected, or the area actually alarmed (floor above and below). Other air handling equipment shall remain online. This shall not supersede any code requirement.

- ELEVATORS: A reset procedure for resetting the elevators after an alarm shall be submitted.

- TROUBLE SIGNAL: Trouble signal shall sound piezoelectric alarm on the fire alarm control panel.

- SUPERVISORY SIGNAL: Supervisory signal shall sound piezoelectric alarm on the fire alarm control panel.

- STAND ALONE DUCT DETECTORS: Provide an annunciator panel to provide notification of trouble alarm and reset feature for associated stand-alone duct detectors. Annunciator panel shall be 120 Volts.

Warranty / Parts

- The warranty period shall commence at Substantial Completion and be for a minimum of one year.
- There shall be **10%** additional parts included at the end of each job. These parts shall include at least 1 of each type of device installed and a total of 10%.

CLOSE-OUT SUBMITTALS

- OPERATION AND MAINTENANCE MANUALS:

  - General: The manuals shall include installation, operation, and service manuals.

  - Programmable Systems: If the system is programmable, a copy of the operating program on diskette or flash drive, the appropriate cable to load the program from a laptop computer, and a programming manual shall be provided. A port and method for downloading detector sensitivity shall be provided.

- AS-BUILT DRAWINGS:

  - Point-to-point Wiring Diagram: A point-to-point wiring diagram shall be included with the "as-built" drawings.

    - A red lined set of As-Built drawings and a hard copy of the points list shall be provided to FSU Fire Safety at the time of the final inspection.

- CAD Format As-Built Drawings: All As-Built drawings shall be submitted as a CD/DVD-ROM disk in AutoCAD format (check for latest acceptable release).

- Field Devices: All field devices installed in the fire alarm control panel shall be included in all diagrams.

- Digital List: A copy of the addressable points list shall be provided to the FSU Fire Safety or local facilities director in an EXCEL format in a method acceptable to the department.

- Function Diagram: A one-line function diagram of the fire alarm control panel shall be provided.

- REPORTS:

  - Certification (completion) documents in accordance with NFPA 72

  - The Sound Pressure and Intelligibility reports showing the results and location of each audible device connected to the fire alarm system shall be provided at time of final inspection.

MAINTENANCE ITEMS

- All spare parts, special tools, equipment, keys, etc. required for maintenance or operation shall be turned over to the EH&S Fire Safety Section or the local facilities director when the system is accepted.