

## SECTION 28 30 00 - FIRE AND SMOKE DETECTION SYSTEM

### PART I - GENERAL

#### 1.1 RELATED SECTIONS

- A. 23-09-13- *Instrumentation And Control Devices For HVAC*
- B. 26-05-33- *Raceways And Conduits*
- C. 26-05-19- *Conductors And Cable*
- D. 26-80-00- *Elevator Electrical Requirements*

#### 1.2 SUMMARY

- A. Work shall include, but not be limited to the following:
  - 1. Fire alarm panels: Siemens XLSV. Voice system shall be designed to meet the building needs. *[Note to AE: Contact Owner in regard to the Capital Project Brand Name Policy.]*
  - 2. Automatic smoke and heat detection.
  - 3. Manual alarm initiation.
  - 4. Air handling unit (AHU) controls to integrate AHU into the fire alarm system operation (where applicable).
  - 5. Monitor of sprinkler water flow and supervisory alarm switches.
  - 6. Alarm annunciation.
  - 7. Elevator recall.
  - 8. Elevator machine room sprinkler system and equipment shutdown.
  - 9. Stairwell pressurization.
  - 10. Smoke removal and smoke exhaust.
  - 11. XLSV panel microphone shall integrate with the building Public Address (PA) system (where applicable).
  - 12. Smoke Outage: See *Drawing 28 30 00-1, Disconnect Switches for XLS System.*
- B. No Work shall be performed until the Shop Drawings and product data have been approved by Owner. This will require early processing of all submittals. The Contractor is solely liable for any Work performed or material purchases made prior to this approval.
- C. The Contractor shall be responsible for the zoning system to comply with all applicable codes. For renovation projects the zoning system shall resemble existing zoning schemes in the building being modified. The Contractor shall be responsible for the proper location of all devices to comply with applicable codes.
- D. Each system shall be electrically supervised, connected, tested and proven to be in operating order.
- E. See *Drawings 28 30 00-1, 28 30 00-2, 28 30 00-3, and 28 30 00-4.*

#### 1.3 TEMPORARY PROTECTION

- A. Where modifications to existing fire alarm devices or equipment cause Interim Life Safety Measures to remain in place for a period of time exceeding 48 hours, temporary protection shall be provided to the affected area.
- B. Temporary protection shall comply with the requirements listed in this Section.

#### 1.4 QUALITY ASSURANCE

- A. Compliance: This installation shall be made in accordance with the Drawings, Specification and the following:
  - 1. National Electrical Code, Article 760, NFPA 70.
  - 2. National Fire Protection Association, *National Fire Alarm Code, Standard No. 72*.
  - 3. National Fire Protection Association, *Installation of Sprinkler Systems, Standard No. 13*.
  - 4. Local Codes and Authorities having jurisdiction.
- B. Shielding Conductors: Wiring requirements for shielding certain conductors from others or routing in separate raceways shall be as recommended by the manufacturer's documentation.
- C. UL Listed: The system, including all components, shall be listed by Underwriters Laboratories Inc. for use as a fire protective signaling system.
- D. Registration: The fire alarm Supplier and Installer shall be registered with the State of Illinois Department of Registration and Education as a Private Alarm Contracting Agency. Proof of registration shall be submitted with the shop drawings.

#### 1.5 SPECIAL CONDITIONS

- A. Local Representation: The manufacturer or his authorized distributor shall confirm that within reasonable distance of the job site, within 3 hours of travel time, there is an established agency which stocks a full complement of parts and offers service during normal working hours on all equipment to be furnished, and that the agency will supply parts without delay.
- B. New Materials: All material and equipment shall be new and unused.
- C. Communication with NCC/WAN in Public Safety Building: Communication with the NCC/WAN at the Police/Fire Dispatch Center in the Public Safety Building requires a twisted pair between the NCC/WAN at the Police/Fire Dispatch Center in the Public Safety Building and the XLS-V control panel at the building. *[Note to AE: This twisted pair shall use the Campus Signal System if available. If the Campus Signal System is not present at the building then the twisted pair shall be obtained from CITES. Availability of the Campus Signal System may be determined by checking with the Owner. Availability and installation costs for a Telecommunications twisted pair line may be obtained from CITES. After contacting Owner in regard to twisted pair availability, insert project specific information here.]*
- D. Latest Revision: All hardware and software furnished shall be the manufacturer's latest revision or product version, at the time of final acceptance.
- E. Continuous Operation: All individual components and composite systems shall be designed for continuous operation without undue heating or change in rated values, and shall be properly fused or protected.

#### 1.6 WARRANTY

- A. Contractor Warranty: All equipment and systems shall be warranted by the Contractor for a period of 1 year following acceptance. The warranty shall include parts, labor, prompt field service, pickup and delivery.
- B. Manufacturer Warranty: In addition to the Contractor's warranty, the manufacturer, Siemens, shall provide 1 additional year parts warranty.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION AND FUNCTION

- A. System Includes: The automatic fire detection and alarm system shall consist of the main control panel, initiation devices, voice system, audible-visual alarms, suppression systems supervision, food service dry chemical systems supervision, sprinkler waterflow, magnetic door holders, gate valve supervisory switches, and a working communication link with the Campus NCC/WAN located at the Police/Fire Dispatch Center in the Public Safety Building. In addition, a Gamewell master box and connection to the Campus Fire Alarm Loop shall be provided. The XLSV system shall be capable of being expanded at any time up to the predetermined maximum capacity of the system.
- B. Supervision and Control: The system shall be capable of operating with both addressable and non-addressable manual, ionization, thermal, infrared and photoelectric detecting devices, water-flow switches and supervisory switches. The control panel shall provide power, annunciation, supervision and control for the fire detection and alarm system. The system shall be designed such that alarm indications override trouble conditions. The panel shall be capable of measuring the sensitivity of the addressable ionization and photoelectric detectors connected to it. External loop circuit supervision shall not require additional wires other than the pair used for detection of alarm. Only 2 wires shall be used from the control panel to each loop of initiating devices and 2 wires for the audible devices. These 2 wires shall provide both supervision and alarm signals. There shall be no loss of supervision for class "B" wired addressable devices. Class "A" supervision may be provided by adding an additional pair of wires.
- C. System Function: The system shall function as follows when any area or duct detector, manual station or waterflow switch operates:
1. Sound required audible devices as shown on the schedule.
  2. Automatically activate the master box to notify central McCulloh Loop campus fire alarm reporting system at the Police/Fire Dispatch Center in the Public Safety Building, via the Campus Fire Alarm Loop.
  3. Automatically transmit an alarm indication to the NCC/WAN Control Center at the Police/Fire Dispatch Center in the Public Safety Building.
  4. Display individual detector and/or zone number on alphanumeric display with the user defined message.
  5. Light an indicating lamp on the device initiating the alarm.
  6. Initiate the sequence of operations specified for that device; e.g., alarm, local, general, reporting, trouble reporting only. Alarm shall have priority over trouble. Trouble conditions shall be reported to include the device number, location and type of trouble.
  7. A suppression system device shall not be used to replace an area detector as an alarm initiation device.
- D. Shutdown of the HVAC system and operation of dampers is only to be initiated by duct detectors or smoke detectors.
- E. The fire alarm system is of the addressable initiating device type. Each device monitored for alarm, trouble, or other purposes shall have a unique address. Monitoring or controlling more than 1 device with only 1 address is not permitted.

### 2.2 CONTROL EQUIPMENT

- A. Panel Construction and Capacity: The control panel shall provide power, annunciation, supervision and control for the detection and alarm system. The control panel shall be modular in construction, and contain all modules necessary to operate as specified and

indicated. The system shall be capable of reading and displaying at the control panel, the sensitivity of remote addressable ionization and photoelectric detection devices. Individual addressable detection device alarm threshold shall remain 100 percent operational and capable of responding to an alarm condition while in the routine maintenance mode. Addressable detection devices shall be individually identified by the system and any quantity of addressable detection devices shall be in alarm at any time up to the total number connected to the system.

- B. Addressable and Non-Addressable: The control panel shall be capable of supporting non-addressable as well as addressable detection devices.
- C. See *Drawing 28 30 00-4, Phone Bridge*: The control panel shall be provided with modem board for transmission of system serial data to the campus NCC/WAN.
- D. Program Function Switches: See *Drawing 28 30 00-1, Disconnect Switches for XLS System*.
- E. Permanent Records: The control panel shall support a connection to the NCC/WAN. The connection to the NCC/WAN shall be used for permanent records of the fire alarm system's status and detector chamber voltages, and shall also be capable of system control as configured.
- F. Initiating Circuits: Class "B" wiring only.
- G. DC Audible and Visual Devices: An output circuit for operation of DC audible and visual devices, leased line or tie, or Clean Agent release shall be provided by a Siemens Division programmable signal module. This module shall be system interconnected by a card edge connector, and shall be operable by the XLSV control unit. Upon command by the XLSV control unit, the output circuits will respond as configured. All signal circuits shall require and be fitted with an end of line device.
- H. AHU and Elevator Control: For control of air handling units and elevators there shall be provided a Siemens Division programmable supplementary relay module. The module shall be system interconnected by a card edge connector and shall be operable by the XLSV control unit or manually. It shall contain 4 independent relays, fitted with form "C" contacts, rated at 120 VAC, 2 AMPS resistive or a remote located addressable interface with relay module, model HTRI could be utilized. Coordinate with Building Automation System (BAS) documents and provide as required for the indicated control.
- I. Elevator Recall Subfunction: An elevator recall subfunction shall be provided. Elevators shall be recalled only when elevator lobby or machine room detectors are activated to alarm state. No other detector shall activate elevator recall.

### 2.3 ALARM INITIATING DEVICES

- A. Photo and Thermal Detectors: All addressable and non-addressable photo, ionization, and thermal detectors shall be of the Siemens "Fireprint" series, and shall be capable of being intermixed on the same control panel. All detection devices shall contain an integral alarm LED. All addressable detectors shall be individually identifiable from the control panel. Non-addressable detectors shall be identifiable by zone.
- B. Addressable Thermal Detectors: The addressable thermal detectors shall be of the rate compensated fixed temperature type and shall be listed by Underwriters Laboratories Inc. The addressable thermal detectors shall be individually annunciated on the control panel. The addressable thermal detectors shall contain an integral alarm lamp. The addressable thermal detector shall be Siemens Division HFPT-11 series.
- C. Duct Detectors
  - 1. Detector Mounting: The duct detectors shall be listed by Underwriter's Laboratories, Inc. The duct detectors shall operate on a cross-sectional air sampling principle to overcome

stratification and the skin effect. The duct detector shall consist of an addressable photo detector mounted in an addressable assembly and a sampling tube.

## 2.4 ALARM INDICATING DEVICES

- A. Audible/Visual Devices: Shall be the same as the fire alarm panel manufacturer.

## 2.5 MAGNETIC DOOR HOLDERS

- A. Magnetic Door Holder Devices: Magnetic door holders shall be dual rated for 120 Volt and 24 Volt DC. Door holders shall be flush mounted and have an adjustable hold force of 10 to 40 pounds at 85 percent of rated power supply. If wired for 120 Volt AC, the power shall come from a local emergency power panel. If wired for 24 Volt DC the power is to come from the FACP or nearest PAD. Seimens Division shall manufacture the magnetic door holder devices.

## 2.6 ELEVATOR RELATED DETECTION AND ALARM REQUIREMENTS

### A. General

1. Smoke Detectors are required in all elevator lobbies and elevator machine rooms. Only the smoke detectors located in elevator lobbies and machine rooms shall affect the specific elevator in the building. ASME A17.1, NFPA 72, 3-9.3. *[Note to AE: Include wording in appropriate section of construction documents and show on the fire alarm drawings.]*
2. Smoke and heat detectors are never required in elevator pits and shall not be installed in them.
3. Smoke detectors are not required in hoist way overheads, and shall not be installed in them.
4. Hoistway Venting: All machine room and lobby smoke detectors shall activate a fire alarm addressable relay to open the smoke vent if venting is present at the top of the hoistway.
5. If a sprinkler head is present in the elevator hoistway overhead, a heat detector with associated shunt trip shall be provided within 2' of the sprinkler head. A sprinkler is typically only allowed in elevator hoistways in older existing buildings due to fire rating requirements of shaft and elevator cab. (ASME A17.1) *[Note to AE: Include wording in appropriate section of construction documents and show on the fire alarm drawings.]*

### B. Fireman's Service Phase 1 and Phase 2:

1. Programming: Smoke detectors in elevator lobbies on floors other than the designated floor and the elevator machine room; shall be programmed upon activation to provide 1 contact closure that shall be input to the elevator controller that shall place the elevator in Fireman's Service Phase I. This shall be accomplished by outputs of the smoke detectors on all floors except for the designated floor and elevator machine room.
2. Designated Floor Programming: The designated floor elevator lobby smoke detector shall be programmed upon activation to provide contact closure that shall be input to the elevator that shall place the elevator in Fireman's Service Phase 1 alternate floor.
3. Elevator Recall Subfunctions: The elevator recall subfunctions shall operate only when elevator lobby or machine room initiating devices are activated to alarm state. No other detectors or initiating devices shall activate any of the elevator recall subfunctions.
4. Elevator Machine room smoke detector shall also activate a fire alarm addressable relay for the "Fireman's Hat" flashing light. Service visual signal of the elevator controls as is required by ASME A17.1
5. Elevator Supplier: The programming of all elevator subfunctions shall be coordinated with the elevator supplier to ensure proper operation.

6. New and Remodel Projects: Requirements of this Section shall apply to both new construction and remodel Projects.

C. Shunt Trip Circuit Breaker/Fire Alarm System/Fire Protection Sprinkler Control

1. Hoistways and Elevator Equipment Rooms: If hoistways and elevator equipment rooms are protected by fire protection sprinkler systems, they shall each be equipped with a heat detector and shunt trip circuit breaker feeding electrical power to the elevator equipment.
2. Heat Detector Alarm: When the heat detector goes into alarm it shall signal the shunt trip circuit breaker to trip. The temperature setpoint of the heat detector shall be less than the temperature setpoint of the fire protection sprinkler heads in the space. A heat detector is required to be located within 24" of the sprinkler. NFPA. *[Note to AE: Include wording in appropriate section of construction documents and show on the fire alarm drawings.]* A heat detector is not required in the elevator pit even if there is a sprinkler present provided that the sprinkler is installed within 24" of pit floor.
3. Smoke Detectors in Elevator Lobbies: This control scheme shall operate with the smoke detectors in the elevator lobbies and their Fireman's Service, Phases 1 and 2 control scheme.
4. Elevator Shunt Trip: The shunt trip power shall be supplied from a fire alarm system that has a UPS/battery backup, or any power source used in conjunction with a power monitor.
5. Power Monitor: The shunt trip fire alarm addressable relay shall monitor the shunt trip power monitor, via its supervisory switch.

## 2.7 FIRE PROTECTION SPRINKLER SYSTEM INTERFACE

- A. Monitor Sprinkler System: The fire alarm system shall monitor the sprinkler system as described below.
- B. Monitor Each Flow Switch: Provide an alarm causing addressable interface module to monitor each flow switch. Upon flow a system alarm shall be generated that shall activate the building evacuation signals, trip the master box, and transmit an alarm message to the NCC/WAN located at the Public Safety Building. This shall include each flow switch in the system, including the main system flow switch and zone flow switches on each section of branch piping. Each flow switch shall be monitored by an addressable interface module with a unique address. The system shall display a unique alarm message for each flow switch monitored.
- C. Monitor Each Shutoff Valve: Provide a trouble causing addressable interface module to monitor each shutoff valve in the system. Upon sensing valve position other than full open a system trouble shall be generated that shall transmit a trouble message to the NCC/WAN located at the Public Safety Building. All system valves shall be monitored including water supply valves, sectional control valves and all other valves in supply piping to sprinklers. Each valve shall be monitored by an addressable interface module with a unique address. The system shall display a unique address and unique trouble message for each valve.
- D. Monitor Fire Pump: Provide a supervisory causing addressable interface module to monitor the operation (pump run) of the fire pump. This alarm shall transmit a unique alarm message to the NCC/WAN located at the Public Safety Building. A fire pump run alarm *shall not* activate the system audio visual evacuation devices; activate the subfunctions such as fan shutdown an elevator recall; and trip the master box.

## 2.8 GAMEWELL MASTER BOX

- A. Brand Name: *[Note to AE: Contact Owner in regard to the Capital Project Brand Name Policy.]*
- B. Type: The master box shall be a 3-fold, shunt trip, non-interfering type with a 4 digit code. The master box timing shall be such that 4 rounds are transmitted in 40 seconds. The

master box shall be as manufactured by Gamewell, Model No. M34-104. Provide lock to fit Gamewell key number 25460.

- C. Enclosure: The Gamewell Master Box shall be located in a flush mounted enclosure. This flush mounted enclosure shall have a locked door, and the lock shall be keyed to a Gamewell key number 25460.
- D. Four Digit Code Assignment: The four digit code assignment shall be made by the Owner upon request.
- E. Tripped or Non-Reset Condition: The master box shall be equipped with a contact that shall interface with the system control panel to indicate trouble when the master box is in a tripped or non-reset condition.
- F. Hardware and Software: System hardware and software shall be provided to interface with the Gamewell Master Box as follows: Trouble indication shall be generated when the Master Box is tripped with a message on the 32 character alphanumeric display. The Master Box tripped status shall be indicated by HTRI type addressable interface module monitoring internal Master Box contacts. This is an additional check on the status of the Master Box, as Master Boxes are designed so that the door cannot be closed if a bypass plug is in place.

## 2.9 CAMPUS MCCULLOH LOOP CENTRAL FIRE ALARM LOOP SYSTEM

- A. Existing Central Fire Alarm System: The campus operates a McCulloh Loop Central Fire Alarm System connecting over 200 campus buildings to a central station system at the Public Safety Building.
- B. Connect to System: Each new building shall include an extension of the McCulloh Loop system and installation of a Gamewell Master Box.
- C. Cable Type: Refer to section 26-05-19 *Conductors and Cable*.
- D. Routing Cable: The loop cable shall be routed in signal cable duct cells of the electrical distribution underground duct system. No wye splices are permitted. The cable shall be tagged in each electrical manhole and junction box. Cables shall be routed through electrical manholes with a routing not to interfere with existing or future high voltage distribution cable routes. Splices of the loop cable shall be located near the top of the electrical manholes.
- E. Details of Existing System: *[Note to AE: Information about the availability, route, and details of this system is available from the Owner].*

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Installation of fire alarm system shall not be done in conflict with manufacturer requirements.
- B. Panels: Control and other panels shall be mounted with sufficient clearance for observation and testing. Fire alarm control panel shall not be installed where it could be exposed to excessive heat, moisture, or drastic temperature change. Fire alarm control panel shall either be located at the building entrance, or there shall be a remote annunciator located at the building entrance. All fire alarm junction boxes shall be clearly marked, by painting covers bright red, for easy identification.
- C. Wiring: All wiring shall be in metallic conduit, EMT or other approved methods. Flexible connectors shall be used for all devices mounted in suspended lay-in ceiling panels. All conduit, mounting boxes, junction boxes and panels shall be securely hung and fastened with appropriate fittings to ensure positive grounding throughout the entire system. All wiring shall be color coded and labeled at each junction box and device. All wiring shall be per NEC and manufacturer direction, checked and tested to ensure that there are no grounds, opens or shorts. Initiating circuit conductors shall be no smaller than size 18AWG. Notification circuit conductors shall be no smaller than size 14AWG.

- D. Labeling: No wiring other than that directly associated with fire alarm detection, alarm or auxiliary fire protection functions shall be in fire alarm conduits. Wiring splices shall be avoided to the extent possible, and if needed they shall be made only in junction boxes, and enclosed by plastic wire nut type connectors. Transposing or changing color coding of wires shall not be permitted. All conductors in conduit containing more than 1 wire shall be labeled on each end, in all junction boxes, and at each device with "E-Z Markers" or equivalent. Conductors in cabinets shall be carefully formed and harnessed so that each drops off directly opposite to its terminal. Cabinet terminals shall be numbered and coded, and no unterminated conductors are permitted in cabinets or control panels. All controls, function switches, etc., shall be clearly labeled on all equipment panels.
- E. Audible Suppression Devices: Provide, as required, audible suppression devices for interference-free and properly operating system and that both audible and multiplex wiring be run in same raceway.
- F. Master Box Ground Conductor: The master box installation shall include a ground conductor bonded to the master box and bonded to the building's main ground bus. This ground conductor may be routed with the campus McCulloh Loop conductors serving the master box.
- G. Incoming Terminal Box: Each building shall include an incoming terminal box for the campus McCulloh Loop central fire alarm system. The box shall be a minimum size of 8 inches wide and 10 inches high, with a maximum depth of 4 inches. The interior of the box shall be equipped with a backboard and terminal strip. The terminal strip shall have screw type terminals suitable for termination of #12 AWG, solid conductors.

### 3.2 TEST AND REPORTS

- A. Electrical And Mechanical Tests: The Contractor shall perform all electrical and mechanical tests required by the equipment manufacturer's standard checkout procedure.
- B. 3 Items Required Prior to Test: At the time the system is tested, the Contractor shall supply the following items to the Owner before the test is started. If the following three items are not supplied, the tests shall *not* be allowed to begin.
  - 1. A copy of the Siemens Division Custom Software Generator printout.
  - 2. Drawings showing the floor plan of the building, device locations, and device addresses.
  - 3. A copy of the system software, all necessary communications software, all applicable client licenses, and demonstration that the system can be accessed by an Owner portable computer.
- C. Test Entire System: Final testing of the system shall not occur until the entire system is 100 percent complete and fully functioning. In the event that phased construction schedules require partial system operation, portions of the system may be tested. However, the entire system must be operating and fully functional before final testing, final acceptance and substantial completion shall be allowed to occur.
- D. Smoke and Heat Detection Systems Demonstration: The completed smoke and heat detection systems shall be demonstrated to ensure their proper operation. This demonstration shall consist of activating the installed smoke detectors with U. L. listed test smoke, by U. L. approved methods. Heat detectors shall be demonstrated by activation with heat. Also, all interfaces with fans, elevators, or any other building systems shall be operated to demonstrate their correct installation. The test shall include accessing the system on an Owner computer. The Contractor shall furnish all system passwords, communication software, and system software to demonstrate. The software and passwords shall remain with the Owner for use in the continuing operation and maintenance of the system.
- E. Coordination with Elevator Final Inspection: *[Note to AE: Include wording in appropriate section of construction documents and show on the fire alarm drawings.]* All fire detection related items associated with the building including, but not limited to, smoke and heat

detectors, main line shunt trips, hoistway damper and all devices interfaced with these devices associated with the fire detection system shall be pre-tested and found to be completely functional before a site inspection test is scheduled with the elevator contractor, state elevator inspector and the Owner. Failure to pre-test may result in actions allowed by the contract documents.

- F. Report: The report shall include:
1. A complete list of equipment installed and wired.
  2. Indication that all equipment is properly installed and functions and conforms to these Specifications.
  3. Tests of each individual zone or for each individual device as applicable.
  4. Voltage (sensitivity) settings for each ionization detector as measured in place with the HVAC system operating.
  5. Response time on thermostats and flame detectors (if used).
  6. Technician's name, certificate number and date.
  7. Proof of certification of the system in accordance with NPPA 72.
- G. Final Testing: Final tests and inspection shall be held in the presence of AE and Owner personnel and to their satisfaction. The Contractor shall supply personnel and required auxiliary equipment for this test without additional cost. Any problems identified during system testing shall be corrected by reprogramming the XLSV system. After the reprogramming is complete, the Contractor shall submit the Zues printout used for the subject reprogramming to the Owner.
- H. Closeout Submittals: After completion of all the tests and adjustments listed above, the Contractor shall submit the following information to the AE and the Owner:
1. As-built" conduit layout diagrams including wire color code and/or tag number.
  2. Complete "as-built" wiring diagrams.
  3. Detailed catalog data on all installed system components.
  4. Copy of the test report.
  5. A copy of the Siemens Division Custom Software Generator printout.
  6. Drawings showing the floor plan of the building, device locations, and device addresses.
  7. A copy of the system software, all necessary communications software, all applicable client licenses, and demonstration that the system can be accessed by an Owner portable computer.
- I. Operating and Maintenance Manual: Comply with all requirements listed in *Section 01 78 23 – Operation and Maintenance Data*. Before final acceptance of Work, the Contractor shall deliver 3 copies of a composite *Operating and Shop Maintenance Manual*. **If this is a Housing related project, 4 copies are required.** Each manual shall contain a statement of guarantee including date of termination and name and phone number of the person to be called in the event of equipment failure, including individual factory issued manuals containing all technical information on each piece of equipment installed. In the event such manuals are not obtainable from the factory it shall be the responsibility of the Contractor to compile and include them.
- J. 90 Day Verification: Acceptance of the system shall also require a demonstration of the stability of the system. This shall be adequately demonstrated if the system operates for a 90-day test period without any unwarranted alarms. Should an unwarranted alarm occur, the Contractor shall readjust or replace the detector(s) and begin another 90-day test period. As required by the AE, the Contractor shall recheck the detectors using the fire test after each

readjustment or replacement of detector. This test shall not start until the Owner has obtained beneficial use of the building under tests.

### 3.3 TRAINING

- A. Training: *[Note to AE: Edit this paragraph to be specific to the project.]* Provide three, 3-hour training sessions, with 1 session per day for 3 consecutive days, for campus Fire Department affiliates. Provide one 4-hour session of training in operation and maintenance. Training times indicated are actual times exclusive of travel.

END OF SECTION **28** 30 00

This section of the *U of I Facilities Standards* establishes minimum requirements only.  
It should not be used as a complete specification.