

Division 28

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28 00 00 ELECTRONIC SAFETY AND SECURITY

Document	Version Date	Description
Security Access Controls Specifications	June 2015	Security Access Controls Specifications Penn State requires security access control on all new and renovated buildings. Contact Scotty Eble see2@psu.edu Ed Gannon at ejg3@psu.edu for guidance on applying these to your project.
Intrusion Alarm Specification	June 2015	Intrusion Alarm Specification Penn State requires security surveillance on all new and renovated buildings. Contact Scotty Eble see2@psu.edu Ed Gannon at ejg3@psu.edu for guidance on applying these to your project. Video Performance Specification

28 30 00 ELECTRONIC DETECTION AND ALARM

28 31 00 FIRE DETECTION AND ALARM

.01 Microprocessor-Based Fire Alarm Systems (standard for most buildings)

- A. The automatic fire detection and alarm system shall consist of a microprocessor-based main control panel, **Siemens XLS with communication modem (specify that TNS make 2-wire dedicated copper connection to the Siemens NCC-WAN central monitoring equipment in basement of Telecom Building)**, printer, remote annunciator(s), detection devices, manual stations, and alarm-indicating appliances wired in accordance with the schedule on the drawings. System shall function as specified in Factory Installation Manuals.
- B. University Park systems shall be compatible with, and able to report to and be controlled by, the Siemens Pyrotronics **NCC-WAN** Fire Command Center used by University Police

Services. Other campus fire alarm systems shall be as approved by ~~Engineering Services~~ **Physical Security Office**.

- C. System shall typically be “Class B” with the following styles:
 - 1. Initiating style B
 - 2. Signaling (addressable loops) style 4
 - 3. AC: Style Y
- D. Each detector location shall be capable of being annunciated at the control panel.
 - 1. The system shall be capable of multiple alarm reporting.
 - 2. The system shall be capable of initiating and indicating an alarm condition in a degrade mode of operation in the event of processor failure.
 - 3. The system shall be capable of performing a one-person walk test of either the complete system or each individual zone, thereby maintaining full functionality of all zones not being tested.
 - 4. Provide 20% spare capacity per notification appliance circuit and per initiating device circuit. The head-end of the system shall be capable of being expanded at any time up to the predetermined maximum capacity of the system.
 - 5. The system shall be capable of being programmed in the field for the purpose of future expansion.
 - 6. The system shall be capable of going into the Alarm Mode from other modes of operation, such as Test Mode, Trouble Mode, etc.
 - 7. The system shall be capable of measuring the sensitivity of the various detectors connected to it. There should also be a hard copy printout of the sensitivities.
 - 8. External circuit supervision shall not require additional wires other than the pair used for detection or alarm (only two wires shall be used from the control panel to each loop initiating devices and two wires for audible devices). These two wires shall provide both supervision and alarm signals.
 - 9. There shall be no limit, other than maximum system capacity, as to the number of intelligent/analog devices which may be in alarm simultaneously.
 - 10. The system shall function as follows when an area or duct detector, manual station, water flow switch, or other initiating device operates:
 - a. Utilize alarm verification functionality for all smoke detectors, with the exception of those associated with elevator recall, prior to sounding general alarm.
 - b. Sound required audible.
 - c. Automatically notify University Park Police Services.
 - d. Display an individual detector and/or zone number on alphanumeric display with user-defined message.
 - e. Light an indicating lamp on the area or duct detectors initiating an alarm.
 - f. Shut down the HVAC system and operate dampers in the alarmed smoke zone.
 - g. Initiate the elevator recall sequence.
 - h. Close all magnetically held fire doors.
 - 11. Provide full detection for dormitory buildings. Resident room detectors shall have audible bases. Utilize the following sequence of operations for each resident room/suite:

- a. Activation of a resident room/suite smoke detector shall immediately initiate all the notification devices in that room/suite only, and shall cause an alarm condition at the fire alarm control panel, all remote annunciators, and at the central monitoring point. If the alarm is not acknowledged within 15 seconds and verified within 180 seconds, the system shall go into general alarm.
 - b. Activation of a second detector within the same room/suite, or elsewhere in the building, shall send the system into general alarm.
12. Provide partial detection for buildings, other than dormitories, that have full sprinkler coverage. Confirm specific areas to be detected with **Engineering Services-Physical Security Office**, but include the following:
 - a. Corridors.
 - b. Mechanical and electrical rooms. Mechanical rooms may require heat detection rather than smoke, due to the cleanliness of the environment.
 - c. Telecommunications rooms.
 - d. Storage rooms
 - e. Kitchens (**Heat detection**)
 - f. Janitor Closets
 - g. **Stair towers**
13. Additional surge suppression shall be included at 120V AC input to fire alarm power supply and for any conductive wires that run outside of the building footprint.
14. Annunciator panel shall be flush mounted at the entrance closest to the fire department connection and at the main lobby (if these entrances are not the same location).
15. An actual fire alarm system riser diagram including device address and coded message shall be provided with the design documents. A sequence of operation shall be provided with the design documents.
16. All components must be "ADA"-approved.
17. Utilize lead-acid battery backup in lieu of NiCad.
18. All audible alarm devices with temporal **code 3** sound patterns shall be synchronized.
19. Audible and visual devices to be **RED** in color, ~~except on dark wall surfaces where they should be red.~~
20. Pull-stations should **typically** be single-action.
21. Trouble conditions shall be latching.
22. Attempt to get a waiver from sprinklering the elevator machine room(s) and shaft(s) to avoid the requirement for detection and shunt-tripping. If this cannot be avoided, utilize 2 heat detectors one 135 F rate-compensated to recall the car and one fixed at 200 F (or similar) to initiate the shunt trip just prior to the sprinkler operation. Locate 200 F heat detector within 1'-0" of the sprinkler head.
23. Detectors shall not be installed until all work of all other trades is complete, per NFPA 72.
24. Remote Power Supplies and/or Booster Panels: Panels shall not be located in finished spaces. Provide a smoke detector at each panel location.

25. Specify that any duct detector message shall denote the building area covered by that air handler, not the location of the duct smoke detector in alarm.
26. Provide FACP with a sprinkler flow test function so that system does not go into general alarm. Flow alarm disablement shall last 120 minutes and then return to normal condition.
27. Provide FACP with elevator test function so that system does not go into general alarm. Elevator test disablement shall last 120 minutes and then return to normal condition.
28. Provide electronic and hard copy of fire alarm floor plan(s) as-built drawings showing each device with loop identification number and/or address. Plans shall show no other equipment other than fire alarm system.
29. All wiring shall be run in conduit.
30. Mount fire alarm pull stations and similar devices at 44" AFF.
31. Mount fire alarm horns, strobes, horn/strobes, etc. at 90" AFF (to top of lens) or 6" below finished ceiling, whichever is lower.
32. Main building Fire Alarm panel shall be fed from Normal Emergency circuits

.02 Conventional Fire Alarm Systems (only when approved by Physical Security Office-Engineering Services)

- A. Fire alarm system shall be single supervised, non-coded continuous ringing.
- B. Stations shall not have a glass rod or glass plate which must be broken.
- C. It shall be possible to start and stop a fire alarm test from any station without the need of resetting at the control panel.
- D. Specifications shall include a statement that prohibits the use of a thermal cutout in the bell circuit.
- E. Fire alarm system shall be connected to the normal/emergency service. Battery backup shall be provided in the control panel.
- F. Fire alarm bells in finished areas shall be factory prime coated only. Field painting color shall be selected by Professional.
- G. Control panel shall contain a SPDT contact for the Central Control System.
- H. Alarm components for sprinkler systems shall be approved by Factory Mutual.
- I. Panels shall be of modular design for ease of expansion.
- J. Panels shall contain built-in voltage surge suppressors.
- K. Install a separate grounding conductor in all conduits.
- L. Smoke detection systems, if required, shall be the ionization type. The control panel for this system shall be connected to the normal-emergency service. The control panel shall also activate the fire alarm system. Smoke detection systems not connected to a fire alarm panel shall have battery backup.
- M. The annunciator panel shall be installed in an area that will permit visual indication of the detector which has been activated to be easily identified.
- N. ~~Fire Alarm/Smoke Detection System shall be Pyrotronics.~~
- O. An actual fire alarm system riser diagram including device address and coded message shall be provided with the design documents. A sequence of operation shall be provided with the design documents.
- P. All components must be "ADA"-approved.

- Q. Manual and automatic fire alarm systems shall be designed with a minimum of one zone per floor. Manual and automatic devices may be connected to the same zone. Additional zones shall be provided for floor areas that exceed 20,000 square feet.
- R. A remote annunciator shall be installed when more than one zone is required.
- S. System shall be capable of remote dialing to Police Services Phoenix 6600 digital alarm receiver.
- T. Main building Fire Alarm panel shall be fed from Normal Emergency circuits