**DIVISION 16 - ELECTRICAL**

**Section 16720 - Fire Alarm Systems**

**Introduction**

The fire alarm systems here at the University are integrated together into a single reporting system which reports to the U of A police department. To maintain system integrity it has been decided that all systems shall be manufactured by Simplex and shall be compatible with the 4120 addressable multiplexed system as manufactured by Simplex. To maintain and insure system integrity with new projects, the University has developed a guide form specification, which must be edited by the engineer in charge of each particular project. Each fire alarm system specification must be evaluated on an item by item basis and the specification edited to be project specific. For example some projects by the nature of the type of building and its occupancy will be required to have a voice evacuation signal. For most projects the standard horns and strobes no longer will suffice. Smaller projects will not require the complexity of the design that the larger ones will require, and thus some of the specification may be deleted.

For new projects it will be necessary to connect the system back into the central reporting system loop. This loop is composed of a series of cables routed through the existing tunnel network. During the preliminary design it will be necessary for the engineer to discuss with the University Fire Safety representative as to the exact location of the point of connection to this loop.

For existing buildings the system interconnection should be intact, and it will be necessary only to tie the new system into the existing loop at the point of connection.

Where only a few devices are required it will be necessary for the engineer to delete all non applicable portions of the guide form specification and make it project specific.

Typically the fire alarm systems are to be considered a higher quality system than what is normally used in a facility of this type. All new systems are to be fully addressable systems with horns and strobes throughout and in compliance with ADA and NFPA requirements. Smoke detectors are to be used in all corridors. Return air duct smoke detectors shall be provided for all AHU's over 2000 cfm per the International Mechanical Code. All conference rooms and classrooms are to have alarm indicators, with A/V's to be used in larger lecture halls. Strobes are to be used in all restrooms. Pull stations are to be used at all exits from a floor on multistory buildings and at any and all building exits. In addition provide pull stations where required by the NFPA 72. All mechanical rooms shall be protected using heat detectors. All electrical rooms, telecommunications rooms, storerooms, and janitor closets shall be protected using smoke detectors.

Elevators shall have shunt trip detectors installed whenever a sprinkler head is located in the shaft or equipment room. To activate the shunt trip system a heat detector must be installed within 18” of each sprinkler head, and must be coordinated with the sprinkler head such that the heat detector will operate at a lower temperature than the sprinkler head. The heat detectors will notify the system of a problem, which will activate the shunt trip detector through a ZAM module. Elevator recall shall be activated through smoke detectors located at each floor or at the top of the shaft. It may be necessary based on state elevator codes to have both items, side by side, in a shaft. Where the elevator recall function is not available all equipment and programming for a future modification to the elevator shall be provided.

Utilize Class A wiring to all devices on the system. Color codes shall be in accordance with University standards. All conduits shall run concealed unless no other option is available. Conduit, wiring, j-boxes, etc. shall be installed in compliance with other areas of this standard. Conduits shall have a minimum separation of 6’. This is the University’s decision and standards requirement.

All fire alarm systems designed and installed throughout the University shall be capable of being expanded easily and readily. In order to make this easier we would like to require that both alarm and mapnet loops have at least 30% spare capacity.

For all new projects it has been decided that the University will require the new system to be up and fully operational for a minimum of 5 days prior to having the University's State Fire Marshall do his final inspection. At the point in time that the contractor believes that the system is ready to begin the 5 day "burn in" the supplier will certify to the owner that the system is fully operational. Until receipt of this letter the acceptance test will not be considered to have begun. During the acceptance test no modifications to the system can be made. The contractor may be permitted to remove or demolish the existing system where applicable and where permitted by the owner prior to acceptance of the new system by the owner.

**Part 1 - General**

- Provide in accordance with the standards set forth in the guide form specification and instructions from the PDC Electrical Engineer during the pre-design conference.

- Design shall confirm to NFPA 72 (2002 Edition) "Performance Based Design, Partial Coverage, including special requirements of U of A Fire Safety, Risk Management, the International Fire Code (2006 Edition) and the requirements of the University of Arizona Department of Risk Management & Safety Office of the Fire Marshal.

- The consultant shall complete comprehensive plans, and single line diagrams based on the system described in the App-16720 Section of this DSS.

- The consultant shall perform voltage drop calculations as part of the Construction Document Submittal for looped signal circuiting. Signal circuits shall not exceed 70% loading in order to accommodate future system changes.

- Batteries shall support 24 hours of Standby Operation and 15 minutes of Alarm Operation.

- Provide heat detectors in elevator shafts, machine rooms. Set 20°F lower than sprinkler heads, to signal the FACP to shut down the elevators.

- The consultant shall show the following supervisory functions on plans and single line diagrams. All conductors shall be in metal conduit.

- Ethernet circuit from FACP, with jack, to network terminal board.

- Monitoring circuit from each elevator control monitoring circuit (in machine rooms) to the FACP.

- Monitoring circuit from Engine Generator to the FACP, to monitor generator running.

- Circuit from switchboard meter to FACP.

- The consultant shall provide emergency lighting in the vicinity of the FACP.

- Generally speaking, Graphic, LCD, or LED annunciation is not utilized.

**Part 2 - Products**

- Provide in accordance with the standards set for the in the guide form specification Section 16720, as discussed in the introduction to this section, and as directed.

- Where pull stations are susceptible to nuisance vandal pulling, a protective local alarm type covering device shall be provided.

**Part 3 - Execution**

- Provide in accordance with the standards set for the in the guide form specification Section 16720 and as

discussed in the introduction to this section.

- Wiring color codes shall be as specified in division 16195. J-boxes shall be identified as per division 16195.

- Testing. Insert the following language at this Section:
  - "The fire alarm system shall be 100% complete, operational and free from trouble or alarm conditions prior to testing by the Owner. After the Owner has tested and verified operation of the fire alarm system the system shall go through a 5 day burn in time, during which the system shall operate under normal conditions with no modifications by the contractor. At the end of this period the fire alarm system shall be tested and approved by the University's State Fire Marshal. Only upon receipt of approval by the University's State Fire Marshal shall this system be considered complete."

**End of Section 16720**