

**SECTION 28 31 00  
FIRE DETECTION AND ALARM**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Fire alarm detection sensors.
  - 2. Fire alarm flow switches
  - 3. Fire alarm pressure switches
  - 4. Fire alarm horns and strobes.

1.2 SUBMITTALS

- A. Product Data: For each type of fire alarm device, include data on features, accessories, finishes.
- B. Shop Drawings: Show details of each fire alarm device. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.
- C. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, and NFPA 72 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70 and NFPA 72.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following requirements apply to product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturer is limited to manufacturer of the existing fire alarm system.
  - 2. Basis-of-Design Product: The design for each device is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 BASIC PERFORMANCE AND SPECIFICATIONS

- A. All new devices shall be compatible with the existing to remain central fire alarm control panel and system.

- B. All new fire alarm devices shall be compatible and connected to the existing fire alarm system.
- C. Field verify all fire alarm device locations prior to bid and installation. Notify Architect of any issues.
- D. Alarm, trouble and supervisory signals from all reporting devices shall be encoded onto an NFPA Style 4 (Class B) signaling line circuit.
- E. Initiation device circuits shall be wired Class B (NFPA Style B).
- F. Indicating appliance circuits shall be wired Style Y (Class B).
- G. Submit coordinated shop drawings designed by a certified fire alarm designer from the manufacturer of the fire alarm system to the Architect for review.
- H. Drawings from Architect and/or Engineer showing fire alarm device layout are shown for diagrammatic purposes only. Additional devices may be required by Code. Contractor shall provide and submit to the Architect fire alarm permit drawings designed, sealed and signed by a certified fire alarm designer.
- I. All references to manufacturers' model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality.
- J. General system description: the supervised, coded, closed-circuit type system shall so be arranged that pulling a manual pull station or operation of one of the automatic detecting devices will register an alarm at the fire alarm control panel. This will cause immediate and continuous operation of all the building alarm signals to sound the general alarm signal until the alarm has been acknowledged at the control panel.
- K. The system shall have proper listing and/or approval from the following nationally recognized agencies (version based upon code requirements):
  - 1. UL, Underwriters Laboratories, Inc.
  - 2. NFPA 70, National Electrical Code (NEC)
  - 3. NFPA 72, National Fire Alarm Code
- L. All equipment components shall be new and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protected premises protective signaling (fire alarm) system. The authorized representative of the manufacturer shall be responsible for the satisfactory installation of the complete system.
- M. All equipment and components shall be installed in strict compliance with manufacturer's recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation.
- N. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place.
- O. All wiring shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
- P. Cable shall be separated from any open conductors of power or Class 1 circuits, and shall not be placed in any conduit, junction box, or raceway containing these conductors.
- Q. Wiring shall be in accordance with local, state and national codes (e.g., NC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than #18 AWG (1.02 mm) for initiating device circuits and signaling line circuits, and #12 AWG (1.63 mm) for indicating appliance circuits.

- R. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
  
- S. Strobe lights:
  - 1. Shall be compatible with existing fire alarm control panel and system.
  - 2. Shall operate on 24 VDC, nominal.
  - 3. Shall meet the requirements of the ADA as defined in UL Standard 1971, and shall meet the following criteria:
    - a. Unless otherwise noted, the intensity shall be a minimum of 75 candela.
    - b. All strobes in any given area shall be synchronized with other strobes in that area.
    - c. The appliance shall be placed 80 inches above the highest floor level within the space or 6 inches below the ceiling, whichever is lower.
  
- T. Audible/Visual Combination Device
  - 1. Shall meet the applicable requirements of Strobe Lights in this section for visibility.
  - 2. Audible signal shall be 15dB above the ambient sound level.
  
- U. At the final inspection, a factory trained representative of the manufacturer of the fire alarm system and equipment shall demonstrate that the system functions properly in every respect. Submit written report of test to University and Architect.
  
- V. The Contractor and/or the systems manufacturer's representative shall provide a typewritten "Sequence of Operation" to the University.
  
- W. Before final approval of the fire alarm system is requested, provide the Architect, in writing, a statement that all requirements of the building inspection and fire departments have been met in the installation of the fire alarm system.
  
- X. Submit to the University, upon completion of the system installation, a Contractor's fire alarm system certification and description form as outlined by NFPA 72 and an approved inspection form for the fire alarm portion of the system.

### 2.3 FIELD QUALITY CONTROL

- A. Test for existing system: Prior to demolition and start of construction, conduct a fire alarm and coordinate and schedule with University. Notify University and all applicable agencies prior to test. Verify proper system operation with University and all applicable agencies and provide documentation to Architect and University of any issues during test. Notify University, Architect and all applicable agencies of any issues discovered during test.
  
- B. Pre-test: Conduct a pre-test of the fire alarm system prior to final inspection. Notify and coordinate test with University and all applicable agencies. Verify proper system operation and provide documentation to Architect and University of any issues during test. Notify University, Architect and all applicable agencies of any issues discovered during test.
  
- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to fire alarm system, re-test to demonstrate compliance with standards and codes.

END OF SECTION 28 31 00