

Section 28 31 00 Fire Alarm and Smoke Detection Systems

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PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide all detailed engineering, documentation, materials and devices, installation, calibration, software programming and check-out necessary for a complete and fully operational fire detection and alarm system in accordance with the full intent and meaning of the drawings and specifications including, but not limited to, the following:
1. Supply, install and connect all hardware necessary to provide a complete and operational fire detection and alarm system.
 2. Supply, install and wire all field hardware, fire alarm control panel, power supplies, power circuits, alarm initiating devices, audible and visual alarm devices, auxiliary control relays, signal initiating and signaling devices, conduits, wires, fittings and all accessories required for the system to perform as specified as required.
 3. Supply, install, debug and test all software required to provide all software functions described in accordance with the full intent and meaning of the drawings and specifications.
 4. Coordinate the work specified under this Section with other trades and contractors to assure a complete and fully operational system.
- B. The intent of fire detection and alarm system work is specified in this section and indicated on the drawings. The installing contractor shall design and provide a complete system. The Contractor shall provide all fire alarm and initiation devices required for a complete system acceptable to all governing authorities. Provide proper spacing and coverage of all devices.

1.02 CODES / STANDARDS / REFERENCES (LATEST EDITIONS)

- A. National Fire Protection Association (NFPA):
1. NFPA 13 Systems, Installation
 2. NFPA 70 National Electrical Code
 3. NFPA 72 National Fire Alarm Code.
 4. NFPA 101 Life Safety code.
- Q. Local & State Building Codes
- R. In addition the above requirements, comply with all local codes. Where discrepancies exist between codes, drawings or specifications, the more stringent requirement shall prevail. Installation shall be subject to approval, inspection and test of applicable regulatory agencies.

1.03 PLANNER AND INSTALLER QUALIFICATIONS

- A. The installing contractor shall have been actively engaged in the business of designing, selling, installing, and servicing fire alarm systems for at least five (5) years.
- B. The entire Fire Detection and Alarm System shall be installed by an authorized representative of the Fire Alarm Manufacturer and certified by the manufacturer to distribute, sell, and install the specified fire alarm and smoke detection system. Include all components, elements, and testing and acceptance procedures.
- C. The installing contractor shall be licensed by the State Fire Marshall to design, sell, install, and service fire alarm systems as required by the State Insurance Code.
- D. The installing contractor shall have on his staff a Fire Alarm Planning Superintendent (APS) licensed by the State Fire Marshall's office for such purpose and under whose supervision installation, final connections, and check out will take place as required by the State Insurance Code.
- E. The APS shall be a certified NICET Level III state licensed fire alarm planner under whose supervision system design shall take place
- F. The installing contractor shall provide 24-hour, 365 days per year emergency service with factory trained, state licensed service technicians.

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1.04 COORDINATION

- A. It shall be the responsibility of the installing contractor to coordinate all requirements surrounding installation of the fire alarm system with all other trades.

1.05 SUBMITTALS

- A. Fire alarm submittal shall be bound and separate from all other submittals. The installing contractor and/or equipment supplier shall provide complete and detailed shop drawings.

1.06 AS-BUILT DRAWINGS

- A. Prepare and submit detailed "As-Built" drawings. The drawings shall include certified test of the system, testing and acceptance sign-off sheets, and other items specified elsewhere to be performed after initial submission of operation and maintenance manuals, complete wiring diagrams showing connections between all devices and equipment, both factory and field wired. Include a riser diagram and drawings showing the as built location of all devices and equipment. The drawings shall show the system as installed, including all deviations from both the project drawings and the approved shop drawings. The drawings shall be prepared on uniform sized sheets, the same size as the project drawings. These drawings shall be submitted to be inserted in the specified Operations and Maintenance Manuals.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Match Existing

2.04 FIELD DEVICES

- A. All devices shall be supervised for trouble conditions. The fire alarm control panel shall be capable of displaying the type of trouble condition (open, short, device missing/failed). Should a device fail, it shall not hinder the operation of other system devices.
- B. Visual Signals
 1. Strobe lights shall be of the electronic flashing xenon strobe type and operate on 24 VDC. The strobe light shall be capable of producing 75 candela on axis to comply with ADA and UL 1638 requirements, and 15, 30, or 110 candela to comply with UL 1971 requirements. Visual signals in common areas of illumination shall have synchronized flash. Provide white with red letters.
 2. Provide enviro kit for locations where dampness, water or dust are present.
- C. Combination Alarm Signal and High Intensity Visual Signals
 1. Strobe lights shall be of the electronic flashing xenon strobe type and operate on 24 VDC. The strobe light shall be capable of producing 75 candela on axis to comply with ADA requirements, and 15, 30 or 110 candela to comply with UL 1971 requirements. Visual signals in common areas of illumination shall have synchronized flash. Each unit shall provide a Code 3 Temporal tone. The horn shall be capable of an output of 95dB at 10', and intensity adjusted accordingly for the area of coverage. Electronic Mini-Sounder or horn set on low setting shall be provided in interior rooms 900 square feet or less. Mini-sounder shall not be used in any corridors, mechanical electrical rooms and similar large spaces and areas of high ambient noise level. Provide white with red letters.
 2. Provide enviro kit for locations where dampness, water or dust are present.
 3. The audible emergency alarms shall produce a sound that exceeds the prevailing sound level in the room or space by at least 15 dba or shall exceed any maximum sound level with a duration of 60 seconds by 5 dba, whichever is louder with or without protective cover. Sound levels for alarm signals shall not exceed 110 dba at the minimum hearing distance from the audible appliance.
- D. Intelligent Multi-Criteria Photoelectric Smoke Detectors
 1. The intelligent multi-criteria detection device shall include the ability to combine the signal of the thermal sensor with the signal of the photoelectric signal in an effort to react hastily in the event of a fire situation. It shall also include the inherent ability to distinguish between a fire condition and a false alarm condition by examining the characteristics of

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- the thermal and smoke sensing chambers and comparing them to a database of actual fire and deceptive phenomena.
 2. The detectors shall use the photoelectric principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the ANALOG level of smoke density. The detector shall provide automatic sensitivity "drift" compensation. The detector shall also provide a "maintenance alert" feature whereby the detector shall initiate a trouble condition should the unit's sensitivity approach the outside limits of the normal sensitivity window.
 3. The detectors shall provide address-setting means electronically and automatically at the control panel.
 4. The detectors shall provide operational status and alarm state LED. Under normal conditions, the LED shall flash, indicating the detector is operational and in regular communication with the control panel. An output connection shall also be provided in the base for connecting an external remote alarm LED.
 5. The detector shall be semi-flush ceiling mounted and be provided with modular detector head with twist-lock base. No radioactive material shall be used.
 6. Voltage and RF transient protection techniques shall be employed as well as smoke signal verification circuit and an insect screen.
- E. Intelligent Thermal Detectors
1. The detectors shall use dual electronic thermostats to measure temperature levels in its chamber and shall, on command from the control panel, send data to the panel representing the analog temperature level.
 2. The detectors shall provide address-setting means electronically and automatically at the control panel.
 3. The detectors shall provide operational status and alarm state LED. Under normal conditions, the LED shall flash, indicating the detector is operational and in regular communication with the control panel. An output connection shall also be provided in the base for connecting an external remote alarm LED.
 4. The detector shall be semi-flush ceiling mounted and be provided with modular detector head with twist-lock base.
 5. Thermal Detectors shall be combination rate-of-rise and fixed-temperature- rated at 135°F for areas where ambient temperatures do not exceed 100°F and shall be 200°F for areas where ambient temperatures exceed 100°F but not 150°F. The fixed temperature element shall consist of a fusible alloy retainer and actuator shaft. Detectors shall have a smooth ceiling rating of 2,500 square feet. Detectors shall be located as specified and where required by local code authority.
 6. Provide fixed temperature 190°F detector in kitchen in lieu of combination rate-of-rise / fixed-temperature type.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. All installation practices shall be in accordance with, but not limited to, the specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements and recommendations of the National Electrical Code and any authorities having jurisdiction. Proper protection against corrosion shall be provided on all electrical equipment in accordance with the requirements of the National Electrical Code. The installation shall conform to all manufacturers' recommendations.
- B. All boxes, equipment, etc., shall be plumb and square. The contractor must take such precautions as are necessary to prevent and guard against electrostatic hum, to supply adequate ventilation, and to install the equipment to provide reasonable safety for the operator.
- C. In the installation of equipment and cables, coordinate with Architectural drawings for possible conflicts with millwork, casework, marker boards, furniture, lockers, etc., and notify the architect of any discrepancies. Verify modifications before proceeding with installation.

3.02 CABLE AND BOXES INSTALLATION

- A. All circuits shall be protected to avoid interruption of service due to short-circuiting or other conditions, which might adversely affect the connected devices. Each individual signaling circuit shall be classified as a circuit pair.

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- B. The system ground is to be connected to the local ground bus. Under no conditions shall the AC neutral either in a power panel or in receptacle outlets be used for a reference ground.
- C. All wiring shall be in accordance with NFPA 72, the National Electrical Code, Local Codes. All wiring shall conform to recommendations of the equipment manufacturer, and as indicated on the engineered shop drawings.
- D. All wire shall be UL Listed FPL for limited energy (300V) and fire alarm applications and shall be installed in conduit. Limited energy FPLP or MPP wire may be run open in return air ceiling plenums provided such wire is UL Listed for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 and approved by the local authority having jurisdiction.
- E. All fire alarm wiring to be red. All fire alarm circuits shall be identified at each termination and at each 25 feet between terminations.
- F. Systems utilizing open wiring techniques with low smoke plenum cable shall provide conduit in all inaccessible locations, inside concealed walls, all mechanical/electrical rooms, or other areas where wiring might be exposed to view and or subject to damage.
- G. All vertical wiring and all main trunk/riser wiring shall be installed in a complete raceway/conduit system. All riser boxes shall be adequately sized for the number of conductors transversing the respective box as well as the number of terminations required.
- H. All plenum wiring is to be installed parallel and perpendicular to the building structure. Cable shall be bundled with cable ties on a maximum of 2'-6". Install cable in D-ring hangers and secure to the structure at a maximum of 5' on center. Cable shall not lie on ceiling grid or ceiling tiles, light fixtures, piping, ductwork or foreign equipment.
- I. The system ground is to be connected to the local ground bus. Under no conditions shall the AC neutral either in a power panel or in receptacle outlets be used for a reference ground.

END OF SECTION

Section 31 31 16 Termite Control

Specifications

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PART 1 - GENERAL

- 1.01 SECTION INCLUDES
- A. Soil treatment for termite control below grade and foundation perimeter at new and existing buildings.
- 1.02 RELATED SECTIONS
- A. **Section 31 06 20 - Schedules for Earth Moving**
- 1.03 REFERENCES
- A. EPA - Environmental Protection Agency - Federal Insecticide, Fungicide and Rodenticide Act.
- 1.04 SUBMITTALS FOR REVIEW
- A. Section 01 33 00 - Submittals: Procedures for submittals.
 - B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.
- 1.05 SUBMITTALS FOR INFORMATION
- A. Section 01 33 00 - Submittals: Procedures for submittals.
 - B. Test Reports: Indicate regulatory agency approval reports when required.
 - C. Manufacturer's Application Instructions: Indicate caution requirements.
 - D. Manufacturer's Certificate: Certify toxicants meet or exceed specified requirements.
- 1.06 REGULATORY REQUIREMENTS
- A. Conform to applicable code for requirements for application, application licensing, authority to use toxicant chemicals in accordance with EPA.
 - B. Provide certificate of compliance from authority having jurisdiction indicating approval of toxicants.
- 1.07 SEQUENCING
- A. Apply toxicant 12 hours prior to installation of vapor barrier under slabs-on-grade.
- 1.08 WARRANTY
- A. Written in the form of an insurance policy in the amount of 10% of the project construction cost or \$100,000.00, whichever is less, for damages to building and contents. Rating for insurance company shall be A-, IV (4).
 - B. Shall be secured with a bond by a Louisiana-licensed Surety.
 - C. If evidence of termites occurs within warranty period, areas shall be retreated at no cost to the Owner.
 - D. Include optional renewal policy on annual basis after fifth year; fee shall be equitable and agreed upon by applicator and the Owner.
 - E. Test Reports: Indicate regulatory agency approval reports when required.
 - F. 5-years non-prorated from Date of Substantial Completion (not the application date) against infestation and/or termite damage.
 - G. Include coverage for damage and repairs to building and building contents caused by termites. Repair damage. Re-treat where required.
 - H. Inspect and report annually to Owner in writing.

PART 2 - PRODUCTS

- 2.01 MATERIALS
- A. Manufacturers:
 - 1. Dow AgroSciences
 - 2. FMC Corporation
 - 3. American Cyanamid Corp.
 - B. The chemical to be used shall be one which is accepted by the U.S. Department of Agriculture, Division of Insecticides and Fungicides as having prolonged effectiveness as a toxicant against subterranean termites. In no event shall the anticipated effective duration of the termite

Specifications