

Chesterfield Fire and EMS

Fire and Life Safety Division

Fire Alarm System

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FIRE ALARM SYSTEM

NFPA – 72 National Fire Alarm Code (2007), International Building/Fire Codes - Chapter 9 (2009)

Project Name: _____
Project Address: _____
File Number: _____ Date: _____
Code Edition: _____

All supporting documentation showing items listed below are required for review.
The checklist is based upon NFPA 72 – The National Fire Alarm Code (2007 Edition).

General (All submissions shall include the following):

- A minimum of four copies of shop drawings, calculations and submittal data shall be provided with the permit application permitting evaluation of the system prior to installation.
- All fire alarm plans shall contain the following information as a minimum:

All shop drawings shall be drawn on sheets of uniform size and shall contain the following information:

- Name of the building owner and occupant
- Location of the building, including street address, building identification or suite.
- A device legend.
- The date of the plans
- An Input/Output programming matrix. (See Figure A.10.6.2.3(9))

Floor plans drawings shall be drawn to an indicated scale and shall include the following information:

- The floor identification.
- A point of compass.
- The graphic scale(s) used on the plans.
- All walls and doors.
- All partitions extending to within 15 percent of the ceiling height.
- Room descriptions or occupancy.
- The location(s) of all fire alarm system devices and components.

- The location of fire alarm system primary power connection.
- The location of the monitor/control interfaces to other systems.
- Riser locations.
- Routing for Class “A” circuits for compliance with NFPA 72, where applicable.
- Indicate the method(s) of compliance with Section 6.9.10.4 for survivability of emergency voice systems as shown in Section 6.9, where applicable.
- The submitted plans shall indicate the ceiling height and ceiling construction details.

Fire alarm system riser diagrams shall include the following:

- The general arrangement of the system shown in a building-cross section.
- The number of risers.
- The type and number of circuits in each riser.
- The type and number of fire alarm system components and devices on each circuit, on each floor or level.

Control unit wiring diagrams shall be provided for all control equipment (i.e., equipment listed as either control unit or control unit accessory), power supplies, battery chargers, and annunciators and shall include the following information:

- Identification of the control equipment depicted.
- The location(s) of the control equipment.
- All field wiring terminals and terminal identification.
- All circuits connected to the field wiring terminals and circuit identification.
- All indicators and manual controls, including the full text of all labels.
- All field connections to the supervising station signaling equipment, releasing equipment, or fire safety control interfaces.

- Typical wiring diagrams shall be provide for all initiating devices, notification appliances, remote alarm light emitting diodes (LEDs), remote test stations, end-of-line and power supply supervisory devices.
- The installation is required to be certified and placarded in accordance with NFPA 72 – Section 8.3.4.2. Provide on the plans the location of the placard and design criteria information.
- The floor plans shall be drawn to a recognized scale or dimensioned showing the layout of the building including walls and/or partitions for the verification of device spacing.
- The submitted plans shall include the location of all fire rated assemblies and indicate how the rated assemblies will be maintained when penetrated by equipment and/or wiring. Indicate what each room or space is to be used for by the occupants. (IBC – Section 712)

- Provide a device to device wiring arrangement, in the plan view, from fire alarm panel to all devices, inclusive of last device, indicating the location of end of line resister. Indicate the style of wiring used for the verification of system performance under different conditions associated with the functionality. Indicate the size of wiring, the number of conductors used, and the protection methods required by NFPA 70. NFPA 72 – Section 6.6.1, Table 6.6.1; NFPA 72 – Section 6.7 and Table 6.7.
- All exterior circuits shall be provided with surge protection where they enter or exit a building in accordance with NFPA 72 – 4.4.4.3 and the NEC (NFPA 70) Article 800 Parts 1, 2, and 4. Provide a wiring arrangement, size of the wiring, location and mounting detail of the surge suppressor and how the wire is grounded and what it is grounded to. Maximum length of #14 gauge grounding wire shall not exceed 20 feet; grounding cable in excess of 20 feet shall be a minimum of #6 gauge bare copper wire. (*NEW*)
- The floor plan drawings shall indicate the location and number of all alarm-initiating devices and alarm-notification appliances, with the dBA rating, in the plan view. The plans shall indicate the mounting height of all devices, and where devices are ceiling mounted, such as smoke detectors, heat detectors, beam detectors, the plan shall indicate type of ceiling layout (flat, cathedral, sloped, peaked, solid joist construction) and device mounting detail. (Chapter 5)
- The submitted plans shall indicate how each fire alarm zone is designed and laid out in the building to meet provisions of the manufacturer’s accepted practices (number of devices permitted on a zone) and/or as required by the Virginia Uniform Statewide Construction Code (per floor, maximum of 22,500 square feet, and/or maximum of 300 feet in any direction). (IBC 907.6.3)
- Provide a scaled cross-section of detector mounting locations for door closure operation in accordance with NFPA 72 – 5.15.6, Figures 5.16.6.5.1.1; 5.16.6.5.3.1 and 5.16.6.5.3.3.

RISER DIAGRAM

- Provide a single line riser diagram for devices on the fire alarm system for:
 - All initiating devices
 - All indicating devices
 - Elevator capture function
 - Door hold open functions
 - Special locking devices
 - HVAC controls

STAND ALONE INFORMATION

- The HVAC system shall be appropriately balanced prior to testing of the duct mounted smoke detectors. A note to this effect shall be placed on the plans. Contractors shall be

capable of performing air pressure differential testing of the duct mounted smoke detector to verify the proper placement of the device. (NFPA 72 - Chapter 5)

- If duct mounted smoke detectors or area smoke detectors are used to control smoke dampers, the plans shall indicate if the HVAC system is dynamic or static.
- Primary and secondary power sources.
 - The submitted plans shall indicate the location of the circuit breaker for the primary power source and shall have a red marking (red circuit breaker switch). The circuit shall be identified in the circuit break panel as “FIRE ALARM CIRCUIT”. The circuit breaker shall also be equipped with breaker lock. NFPA 72 – Section 4.4.1.4.2.2
 - The submitted plans shall indicate the location of and the identification of the circuit breaker panel and circuit number to be dedicated to the fire alarm system. The location of and identification of the circuit breaker panel and dedicated fire alarm circuit shall be permanently identified at the fire alarm control panel. NFPA 72 – Section 4.4.1.4.2.3
 - The submitted plans shall include calculations for all secondary power sources based on the type and amount of equipment and devices to be installed. NFPA 72 – Section 4.4.4.2.1
 - The submitted plans shall include system voltage drop calculations. NFPA 72 – Section 4.4.4.2.1
- The submitted plans shall show the method of communications with monitoring agencies and the number of telephone lines used for the transmission. NFPA 72 – Section 8.6.3.2.1
- Where the telephone system utilizes fiber optic cable (VoIP) as opposed to a POTS (Plain Old Telephone Service – Copper Wiring from the protected premises to telephone switching station) a minimum 24 hour UPS Power Supply shall be provided in order to comply with NFPA 4.4.1.5.3.1, 4.4.1.5.3.1 (A), 4.4.1.6.3.1 and NFPA 111 – Standard on Stored Electrical Energy Emergency and Standby Power Systems. (*NEW*)
- Provide additional information indicating the method to be used to comply with NFPA 72 – 8.6.3.2.1.5 (7). If a DACT is programmed to call a telephone line (number) that is call forwarded to the line (number) of the DACR, a means shall be implemented to verify the integrity of the call forwarding feature every four hours. Refer to NFPA 72 – A8.6.3.2.1.5 (7). (*NEW*)
- The submitted plans shall show the name, address, and telephone number of the central station(s) monitoring the fire alarm system. Indicate if the company is a UL Listed Central Station or Remote Station. Indicate if the signal transmission is directly to the

central station or if the signal is forwarded from a local central station to an alternate central station. (i.e. – Local central station is not a 24-hour manned location). (*NEW*)

- Manufacturer's data sheets shall be submitted for all equipment used or attached to the system, regardless of who the equipment is provided by or installed by. Where manufacturer's data sheets cover multiple devices, the submitted data sheet shall indicate those devices used in the system. Specifically provide information for the Digital Alarm Communicator Transmitter (DACT) programming options.

- DACT
- All smoke detectors
- All heat detectors
- All pull stations
- All duct detectors
- All sprinkler attachments (water flow, tampers and pressure switches)
- All other initiating devices attached to the FACP
- Control functions initiated through the fire alarm control panel
- All control relays
- All special locking devices
- All notification devices
- All audio/visual appliances
- Other _____

- In R-1 and R-2 occupancies equipped with Type "A" Accessible Units, the requirements for sleeping areas using a combination smoke detector and visible notification appliance(s) or a combination smoke alarm and visible notification appliance(s), the location of the devices and the effective intensity of the visible notification appliance(s) shall comply with NFPA 72 – Section 7.5.4.6 and Table 7.5.4.6.2.

- In R-2 occupancies all units shall be wired to support visible alarm notification appliances. This includes all sleeping and dwelling units, not just Type "A" or "B" Accessible Units. The building fire alarm wiring must be extended to all of the unit smoke detectors, single-station or system smoke detectors, so that audible/visible alarm notification appliances may be connected to the building fire alarm system in accordance with IBC – Section 907.5.2.3.4. Refer to the 2009 International Building Code Commentary for additional information. The submitted plans shall indicate the circuit wiring extension, location of the junction box(es) and termination point. (*NEW*)

- The plans shall include an operational input/output matrix for fire alarm systems that interface with and control the operation of other fire protection devices or peripherals. Use the format indicated in NFPA 72 – Figure A. 10.6.2.3 (9) as a guide.

- Provide a signal schedule to include the following information for INTELLIGENT SYSTEMS:

POINT (A)	TYPE OF SIGNAL (B)	ALPHA NUMERIC NOMENCLATURE (C)	LOCAL FUNCITON (D)	OFF SITE SIGNAL (E)

POINT – Designation by designer of numeric point

TYPE OF SIGNAL – Alarm, Supervisory, or Trouble signal

ALPHA NUMERIC NOMENCLATURE – Type of initiating device (Manual Pull, Sprinkler Water Flow, HVAC Smoke Detector, OS & Y Tamper Switch, PIV Tamper Switch)

LOCAL FUNCTION – Fire alarm system (A.V. activation, Door closure, HVAC Control Function, Suppression System Activation)

OFF/SITE SIGNAL – Generic/Specific signal correlating with each point as transmitted to monitoring company.

NOTE: ARE MULTIPLE COMMON SIGNAL TYPES GROUPED TO TRANSMIT A GENERIC SIGNAL TO THE MONITORING SERVICE?

DOES EACH POINT/ZONE TRANSMIT DISTINCTIVELY TO THE MONITORING SERVICE?

- Provide a signal schedule to include the following information for NON-INTELLIGENT SYSTEMS:

ZONE (A)	TYPE OF SIGNAL (B)	ZONE DESCRIPTION (C)	LOCAL FUNCTION (D)	OFF SITE SIGNAL (E)

POINT – Designation by designer of numeric point or zone identification

TYPE OF SIGNAL – Alarm, Supervisory, or Trouble signal

ZONE DESCRIPTION – Floor level or area of zone.

LOCAL FUNCTION - Fire alarm system (A.V. activation, Door closure, HVAC Control Function, Suppression System Activation)

OFF/SITE SIGNAL – Generic/Specific signal correlating with each point as transmitted to the monitoring company.

NOTE: ARE MULTIPLE COMMON SIGNAL TYPES GROUPED TO TRANSMIT A GENERIC SIGNAL TO THE MONITORING SERVICE?

DOES EACH POINT/ZONE TRANSMIT DISTINCTIVELY TO THE MONITORING SERVICE?