



**SAN BERNARDINO COUNTY FIRE DEPARTMENT
COMMUNITY SAFETY DIVISION**

620 South 'E' Street
San Bernardino, CA 92415-0179
(909) 386-8400

Standard Number

F-5

Revision Date:
3-22-16

FIRE PREVENTION STANDARD

DESIGN, INSTALLATION AND MAINTENANCE OF FIRE ALARM SYSTEMS

AUTHORITY

Sections 102.9, 103 and 104.1 of the 2013 California Fire Code provides that the Fire Code Official of the San Bernardino County Fire Department shall have the authority to adopt policies, procedures, rules, and regulations in order to clarify the application of the Fire Code and to specify requirements not specifically provided for by the Fire Code. For further requirements on this subject, see section 508 of the 2013 California Fire Code. This standard may be modified with the approval of the Fire Code Official.

PURPOSE

The purpose of this standard is to provide the minimum requirements for the design, installation and maintenance of fire alarm systems, including those that are solely for the purpose of monitoring and supervision of a fire sprinkler system.

SCOPE

This standard applies to all new installations and modifications of existing fire alarm systems, within new construction as well as building additions and tenant improvements within existing buildings. This standard and its interpretation is not intended to be applied or enforced where there is any conflict with NFPA 72 or the California Fire Code.

DISCLAIMER

These standards may change without notice. Whenever applicable statutes, regulations and standards are updated and adopted, the latest shall apply. Please contact the Community Safety Division at (909) 386-8400 to determine if these standards have changed.

These requirements do not exempt any individual from complying with other applicable state, county, or city codes and standards.

SUBMITTALS

The following shall be submitted to the Fire Code Official for approval and permit prior to performing any work on any fire alarm system:

- 1) Completed San Bernardino County Fire Department permit application.
- 2) A minimum of three (3) sets of plans describing the work to be done. (For information on what must be included on plans, see sections below in this Standard and the SBCoFD



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Plan Submittal Checklist.) NOTE: All fire alarm system plans shall use the symbols identified in NFPA 170, Standard for Fire Safety Emergency Symbols, current edition.

- 3) NFPA 72 Record of Completion and supplemental forms, with required fields filled out (completed forms are required at time of final inspection)
- 4) Manufacturer's specifications sheets (cut sheets) and CA State Fire Marshal listings for all proposed materials and equipment.
- 5) Copy of U.L. Certificate for Central Station monitoring service, if required.
- 6) Any other important details and information as required by this Standard.
- 7) Payment of all appropriate fees.

DEFINITIONS

FIRE SPRINKLER MONITORING SYSTEM – A fire alarm system that is required by the California Fire Code section 903 and generally installed for the primary purpose of monitoring waterflow and supervising control valves of a fire sprinkler system. The presence of required or non-required manual pull stations, fire detectors, or notification devices on a Fire Sprinkler Monitoring System does not constitute an "Evacuation" type fire alarm system.

FIRE ALARM SYSTEM, EVACUATION TYPE OR "EVAC" TYPE – A fire alarm system that is required by California Fire code section 907 and is installed generally for the primary purposes of early notification and evacuation or relocation of building occupants or other responsible party. Systems of this type can also perform the functions of fire sprinkler water flow monitoring, elevator recall, activation or deactivation of fire doors or delayed egress, shutdown of HVAC units, and a variety of protected premises fire safety functions per NFPA 72. Manual fire alarm systems, automatic fire alarm systems, and combined manual and automatic fire alarm systems as defined by the California Fire Code fall under this definition.

GENERAL

- 1) Fire alarm systems shall be designed to the requirements of NFPA 72 and the currently adopted editions of the California Building Code (CBC), California Fire Code (CFC) with local amendments, National Electrical Code (NEC), and other applicable codes.
- 2) All fire protection or detection systems listed below that are installed within buildings containing an evacuation type fire alarm system, and that perform one or more of the following functions, shall be interconnected to the building fire alarm system. Such



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interconnection and functionality shall be shown on the fire alarm system plans and demonstrated at field inspection:

- a) Gas detection systems
 - b) Kitchen hood and duct extinguishing systems
 - c) Other fixed fire suppression systems, such as dry powder or clean agent
 - d) Emergency warning systems, such as those for hazardous materials release
 - e) Other systems as required by applicable codes or by the Fire Code Official
- 3) Fire alarm systems shall not be integrated or combined with security systems or burglar alarm systems. Remote annunciators used in fire alarm systems shall not be used to annunciate security alarm or any other building system signals unless listed for this use and approved by the Fire Code Official.
- 4) All installers of fire alarm systems shall be qualified as listed below. Failure to show proper credentials may result in a failed inspection. All installers shall possess:
- A State of California C-10 contractor's license (or be employed by the C-10 contractor) and be factory trained and certified for a specific manufacturer and brand of equipment, AND
 - An Electrician Certification-Fire/Life Safety Technician, issued by the State of California Department of Industrial Relations, Division of Labor Standards Enforcement ("blue card") when required by the Fire Code Official OR
 - A minimum of a Level II NICET certification in Fire Alarm Systems, when required by the Fire Code Official.

FIRE ALARM CONTROL PANELS

1. Fire Alarm Control Panels (FACPs,) remote annunciators, and auxiliary power supply panels shall be installed in areas that are easily accessible to Fire Department personnel, with thirty six (36) inches of clear space in front of the equipment. The top of the FACP or other equipment panels shall be mounted at a maximum of sixty (60) inches above finished floor unless specifically approved by the Fire Code Official (**See Diagram F-5.1**).
2. When a fire alarm system is installed in conjunction with a fire sprinkler system, the Fire Alarm Control Panel shall be co-located with the fire sprinkler system risers inside a minimum 4' X 4' room, and accessible by means of an access door as specified in SBCFD Standard F-1. A sign indicating "FIRE ALARM CONTROL PANEL INSIDE" shall be installed on the access door. (**See Figure F-5.2**.) The sign shall be of a durable material, have minimum one (1) inch block letters on a contrasting background, and shall be securely



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mounted. Instructions for silencing and resetting the fire alarm system to restoring to a "normal" condition shall be placed inside each FACP.

3. All FACP's shall be locked or otherwise secured to prevent unauthorized access. A key to each FACP shall be placed in the key (Knox ®) box on the exterior of the building or other easily identified secured location (See SBCoFD Standard A-4.)
4. When fire alarm systems are designed and installed in buildings constructed to protect multiple tenants or residents, the Fire Alarm Control Panel shall be located in an attached or included room or an approved weather resistant enclosure with at least one exterior access door with dimensions of not less than thirty six inches (36") in width and eighty inches (80"). A sign indicating "FIRE ALARM CONTROL PANEL INSIDE" shall be installed on the exterior access door. **(See Figure F-5.2.)** The sign shall be of a durable material, have minimum one (1) inch block letters on a contrasting background, and shall be securely mounted.
5. When FACPs are installed in an area other than in a room directly adjacent to the main exit of the building, a remote annunciator shall be installed located within ten (10) feet of such main exit, such as in an entry way or lobby, or in another easily accessible location as approved by the Fire Code Official. This shall not apply to multiple tenant strip center buildings.

SMOKE AND HEAT DETECTORS

- 1) Smoke detectors and heat detectors shall be listed by the California State Fire Marshal (CSFM) for their use and specific application.
- 2) Duct smoke detectors used for the purposes of HVAC unit(s) shutdown as required by the California Mechanical Code (CMC) section 608, shall be the air-sampling type only. Such detectors shall be monitored for integrity by the fire alarm system and shall be permitted to initiate a supervisory signal only. A manual remote test switch for each detector shall be provided when required by the Fire Code Official for testing.
- 3) Individual duct smoke detectors used for shutdown of HVAC units shall be interconnected so that electrical power to all other individual air handling units within the same smoke compartment is interrupted upon the activation of any individual detector within that compartment (i.e. "global" shutdown.)



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MANUAL PULL STATIONS

- 1) When required, manual pull stations shall be placed near exits per the requirements of the CFC section 907 and NFPA 72. At no time shall a pull station be placed in a utility room or other location not accessible to the public unless specifically approved by the Fire Code Official.
- 2) Manual pull stations which are subject to false alarms may require the installation of a tamper resistant device acceptable to the Fire Code Official, or shall be removed when required.

INSPECTIONS

All fire alarm systems are required to be inspected and tested by the Fire Code Official prior to final approval. The contractor and installer of record shall contact the appropriate SBCoFD office at least forty-eight (48) hours prior to requesting an inspection, and shall notify the SBCoFD office a minimum of twenty four (24) hours for any cancellation of inspections.

The following inspections shall be required for any work done on fire alarm systems:

- 1) "PRE-WIRE INSPECTION":
 - a. The number, types, and locations of all control equipment, initiating and notification devices shall be per the approved plans.
 - b. All electrical boxes shall be marked, dedicated power supply and all conduit in place where required.
- 2) "FINAL INSPECTION":
 - a. All system components shall be tested by the installer prior to scheduling an inspection. The Fire Code Official shall have the authority to document the inspection as "FAILED" when such "pre-testing" has not been done.
 - b. The correct number and type of batteries shall be present. A full 24-hour battery test will be performed when required by the Fire Code Official.
 - c. A full function test of all devices shall be conducted in the presence of the Fire Code Official. All tools and equipment (i.e. ladders, canned smoke, decibel meter, etc.) shall be provided by the contractor. System shall be tested both with monitoring company in test mode as well as Fire Department dispatch in test mode.
 - d. All fire safety functions and other interfaced equipment, such as waterflow, HVAC shutdown, elevator recall, fire door activation etc. shall be tested. Zoning and



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programming of all devices and functions shall be in accordance with the sequence of operations and the approved plans.

- e. Digital Alarm Communicating Transmitters (DACTs), Radio Frequency (RF) and other communications equipment shall be tested for reliability and transmission of appropriate signals.
- f. All power supply circuits shall be labeled per NFPA 72 and tested.
- g. All FACPs, power supplies, annunciators, and other control equipment shall be in place, secured, and properly labeled with signage this Standard and NFPA 72.
- h. Records of Completion, UL Central Station certificates, and contracts for the maintenance and monitoring shall be provided when required.
- i. Any design changes or other field changes to the system as represented on the approved plans will require revised or "as-built" drawings to be submitted and approved by the Fire Code Official prior to further inspections occurring.

FIRE SPRINKLER MONITORING SYSTEMS

- 1) Fire sprinkler monitoring systems that are required only for the purpose of monitoring fire sprinkler water flow and for supervision of control valves shall comply with the requirements of this section as well as other applicable codes and standards.
- 2) Fire sprinkler monitoring systems shall not be required to be interconnected to fixed hood and duct extinguishing systems installed per NFPA 17A, per SFM Code Interpretation 06-006.
- 3) Fire sprinkler monitoring systems shall be required to monitor fixed fire suppression systems, such as clean agent and dry powder systems, if such systems are installed in lieu of fire sprinkler systems.
- 4) Fire sprinkler monitoring systems shall not be required to include a manual pull station per SFM Code Interpretation 08-079.
- 5) Fire sprinkler monitoring systems shall include interior audible or visual notification devices in accordance with SBCoFD Fire Code.
- 6) Fire sprinkler monitoring systems shall not be required to supervise duct detectors in HVAC units, unless automatic shutdown is required per the CMC section 608, per SFM Code Interpretation 06-053.



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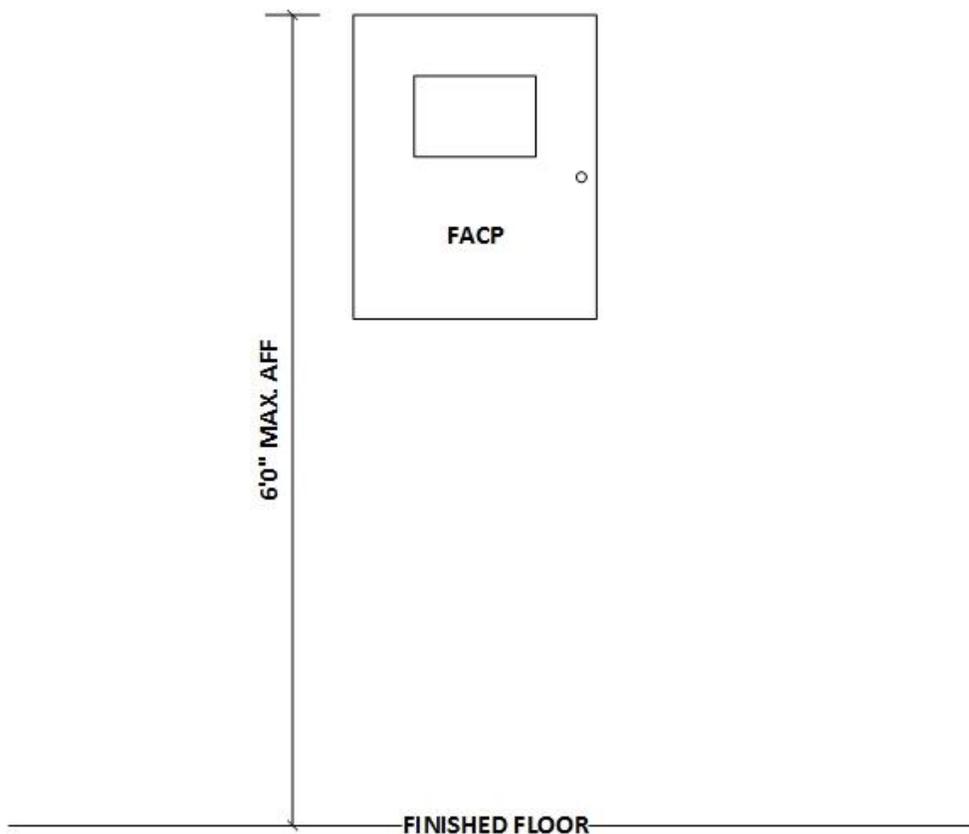
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- 7) Fire sprinkler monitoring systems shall include a remote annunciator when the FACP is located in normally unoccupied location or not within 10 feet of a main exit of the building (See FIRE ALARM CONTROL PANELS section above.)
- 8) Other equipment, such as notification devices, initiating devices, auxiliary system inputs or relays to other fire protection systems or actuation devices may be connected on a voluntary basis to fire sprinkler monitoring systems with the approval of the Fire Code Official. When such other equipment is connected, it shall not be considered a full evacuation fire alarm system. When in doubt, the Fire Code Official may require a formal letter of intent to be submitted by the building owner in order to verify the type of fire alarm system proposed.

FIGURE F-5.1: FIRE ALARM CONTROL PANEL DETAILS





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FIGURE F-5.2: FIRE ALARM CONTROL PANEL SIGNAGE

**FIRE ALARM CONTROL
PANEL INSIDE**