Orange County Fire Authority

Community Risk Reduction

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Fire Alarm, Water Flow Alarm & Signaling Systems

Guideline D-01

Serving the Cities of Aliso Viejo • Buena Park • Cypress • Dana Point • Garden Grove • Irvine • Laguna Hills • Laguna Niguel • Laguna Woods
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Fire Alarm, Water Flow Alarm & Signaling Systems

1. PURPOSE

The purpose of this guideline is to facilitate the design and installation of fire alarm, fire detection, and fire sprinkler supervision (water flow monitoring) systems.

2. SCOPE

The 2025 California Building Code (CBC) and the 2025 California Fire Code (CFC) specify where fire alarm, fire detection, and fire sprinkler supervision systems are required to be installed. CFC, CBC, and 2025 National Fire Protection Association (NFPA) 72 standards apply to the design, installation, operation, testing and maintenance of the systems.

3. PLAN REQUIREMENTS

Refer to the "OCFA Plan Submittal Process" for the most current information on how to submit a plan for review. When a system is required by the CBC or CFC, when a voluntary system will be installed, or when modifications will be made to an existing system, a plan shall be submitted to OCFA by a C-10 California licensed fire alarm contractor or qualified licensed Professional Engineer. The plan shall be prepared as a shop drawing and shall contain the following information:

3.1 A Completed OCFA Fire Alarm System Coversheet, including OCFA's Standard Notes. The occupant history, central station and device count for new, relocated, and replaced devices, shall be filled in by the designer *(the device count in the notes will determine the plan review fee amount).*

3.2 Scope of Work Statement: Include all the following information in the scope of work:

3.2.1 Indicate type of system proposed: Fire alarm notification, fire detection, fire sprinkler supervision, water flow monitoring, etc.

3.2.2 Describe in detail:

1) The limits of the work included in this specific set of plans.
2) The reason for modifying an existing system.

3.2.3 State the CBC Occupancy group from the approved building department architectural plans (contact the project architect).

3.2.4 If the system or component is not required by CBC/CFC, then clearly state that the system or component is voluntary and provide a brief explanation of why the voluntary system will be installed. NFPA 72, 23.3.4

3.2.5 Identify if the communicator will be sole-path or dual-path and identify each communication pathway.

3.3 Contact information: (Provide all)

3.3.1 Designer's name, license number, address, and phone number.

3.3.2 Coordinator or consultant's name, address, and phone number.

3.3.3 Installing contractor's company name, C-10 License number, address, and phone number.

3.4 Project Identification: Provide the name and the address of the project, include building name/number, suite number, street, city, state, and ZIP code (include tract and lot numbers for residential projects only).

3.5 Data Sheets and California State Fire Marshal (CSFM) Listing Sheets: Provide the manufacturer data sheets and CSFM listings for every device used in the system design, with the model numbers highlighted or otherwise clearly identified.

3.6 Completeness of Shop Drawings: Provide a 1/8" = 1' scaled floor plan showing the location of all devices within the scope of work. Identify the areas that are not part of the scope. Shop drawings shall meet the requirements of NFPA 72 7.4 per CFC 907.1.2 and shall include the following, but not limited to: zone requirements, riser and point to point diagrams showing number of devices on each circuit, floor identification, all walls and doors, a description of the intended use for each room and area, terminal and circuit identification, power supplies, and any other information needed to demonstrate the function of the system. Drawings should use the symbols identified in NFPA 170.

3.7 Equipment Legend/Bill of Materials: The legend and bill of materials shall include the new, relocated, and replaced devices and shall match the device count on the OCFA Fire Alarm System Coversheet. The bill of material shall also provide device symbols, manufacturer name, model number, and the California State Fire Marshal listing numbers.

3.8 Sequence of Operations: The sequence of operations should be in an input/output matrix form but may also sometimes be acceptable in a narrative format. A sample of a typical sequence of operations is included at the end of this guideline, but the sequence on each plan shall be specific to the inputs and outputs of that unique system.

4. TECHNICAL REQUIREMENTS

4.1 Annunciator and Main Fire Alarm Control Unit(s) (FACU): A remote annunciator indicating device is required when the FACU is not located in an area that the OCFA would initially respond to or is in an area that may be difficult to gain access to. The annunciator shall be located in the front lobby or at the main entrance area. In multi-tenant suites, it shall be located in the lowest numbered or lettered suite or the suite with the lowest street address.

4.1.1 For scenarios involving multi-buildings and subsystem fire alarm control units (Subpanels): If the main FACU is in a building and a subpanel is in a different building, then the FACU shall automatically reset when the subpanel is reset; the FACU shall not reset the subpanel (NFPA 72 Section 23.8.2.9.).

4.2 Voltage Drop and Battery Calculations: Voltage drop shall not exceed the minimum device specifications needed to meet the device listing. Voltage drop calculations shall be provided for the most demanding circuit(s) in the area of work. The maximum allowable voltage drop on a fire alarm circuit is 10%, or as specified in the fire alarm control panel data sheet, whichever is less. Standby battery calculations shall include both standby and alarm conditions. Calculations shall account for 100% of the load. Any non-fire related device load which is powered through the FACU shall be included calculation. An additional correction factor of 1.25 above the calculated amp-hour capacity is required. The batteries shall be capable of maintaining the system in stand-by mode for 24 hours in a non-alarm condition, and then immediately operate all devices for at least 5 minutes for temporal alarms, and at least 15 minutes for voice alarms (NFPA 72 10.6.7.2).

4.3 Automatic Fire Extinguishing Systems: Where a building fire alarm system is present, automatic fire-extinguishing systems shall transmit a fire alarm signal to a central supervising station. The activation of the extinguishing system shall also activate all notification devices (CFC 904.3.5).

4.4 Single-Path Communicators, Dual-Path Communicators, or Two Phone Lines: Only communicators that are listed by the California State Fire Marshal (CSFM) are acceptable. Provide a copy of the CSFM listing which identifies the model number as listed for use as single-path, sole-path, standalone, or dual-path. When proposing to use a communicator which is CSFM listed only as a dual-path communicator, the communicator must have two methods of communication arranged per the manufacturer's design specifications. Existing systems with two Plain Old Telephone System (POTS) lines may still exist if operable, when no change is proposed to the communication paths (NFPA 72 26.6.3.3, 26.6.3.4).

4.5 Voluntary Systems: If the CBC/CFC does not require a fire alarm system in a building or area, but the building owner opts to have a voluntary system installed, then the nonrequired system may be installed throughout, or may be installed only is a specific area as requested by the building owner. For example, if a new shell office building <u>is not</u> required by CBC/CFC to have a fire alarm notification system throughout, the building owner may opt to have a voluntary fire alarm notification system installed in the building core only. If a new shell office building is required by CBC/CFC to have a fire alarm notification system throughout, then core-only notification is prohibited; the entire shell must be protected by audible and visual notification appliances, and heat/smoke detectors, if required, located per NFPA 72. (NFPA 72, 23.3.4)

4.6 Duct Detection: Duct smoke detectors are required to be tied to the fire alarm control panel if the alarm system is required by CBC/CFC 907.2. Duct detectors shall annunciate as a supervisory signal and shall be transmitted to the central supervising station. Duct detectors shall not initiate audible/visual alarm devices and shall not be transmitted to the fire department. Duct detectors are not required to be monitored by the fire alarm control panel in a building with a fire sprinkler monitoring system or a voluntary fire alarm system; monitoring of the duct detectors in those buildings is optional.

4.7 Manual Fire Alarm Boxes (Manual Pull Stations): Manual fire alarm boxes should not be installed in public accessible areas unless a manual fire alarm is required by CBC/CFC 907. When a single manual pull station is required, or when it is installed voluntarily, it shall be in a room or area accessible only to employees.

4.8 Utilization of Special Egress-Control Devices: Refer to OCFA Guideline E-01

4.9 Hazardous Materials Emergency Alarms: Emergency alarms in Group H Occupancies which are required by CFC 5004.9 shall have visual alarm signals that are blue in color and non-temporal audible alarm signals of a different pattern than the fire alarm system (CFC 908 and 5004.9).

4.10 High-Rise Building Fire Alarm System Requirements: Refer to OCFA Guideline H-01.

4.11 Occupancy Group R-2 Capability of Visual Notification in Dwelling/Sleeping Units: When a fire alarm is required by CBC/CFC 907.2.9.1, every story with dwelling units or sleeping units shall be provided with at least one access point to a notification appliance circuit with the capability to support future visible alarm notification appliances (CBC/CFC 907.5.2.3.3).

4.11.1 The fire alarm designer has three options to choose from to accommodate a future resident with a hearing impairment, which include the following:

- The replacement of audible appliances with combination audible/visual appliances or additional visible notification appliances. If this option is selected, the audible appliances in each unit shall be located as required by NFPA 72 18.5.5 for visual appliances and shall be wired with a notification appliance circuit capable of supporting the future installation of combination audible/visual appliances. The shop drawings shall include a conversion plan for a typical unit, including a weather-proof strobe in the bathroom; smoke detected in the unit shall initiate a local audible and visual fire alarm throughout the unit and may send a supervisory signal to the fire alarm control panel and to the supervising station but shall not dispatch the fire department.
- The future extension of the existing wiring from the unit smoke alarm locations to the future locations of the visible appliances, including a weather-proof strobe in

each bathroom. If this option is selected, at least one of the smoke detector or smoke alarm junction boxes in each unit shall be pre-wired with a notification appliance circuit capable of supporting the future installation of visual appliances. The shop drawings shall include a conversion plan for a typical unit, including a weather-proof strobe in the bathroom; smoke detected in the unit shall initiate a local audible and visual fire alarm throughout the unit and may send a supervisory signal to the fire alarm control panel and to the supervising station but shall not dispatch the fire department.

- The future addition of visible alarm notification appliances from a single access point on each story. If this option is selected, the fire alarm power supply and circuits shall have not less than 5% excess capacity to accommodate the future addition of visible alarm notification appliances; the shop drawings shall include a conversion plan for a typical unit, including a weather-proof strobe in each bathroom; smoke detection in the unit shall initiate a local audible and visual fire alarm throughout the unit and may send a supervisory signal to the fire alarm control panel and to the supervising station but shall not dispatch the fire department.

Example Sequence of Operations

DEVICE / ACTION	MANUAL PULL STATION	SMOKE DETECTOR	HEAT DETECTOR	DUCT SMOKE DETECTOR	ELEVATOR MACH RM SMOKE	SPRINKLER VALVE TAMPER SWITCH	POST INDICATOR VALVE	SPRINKLER WATER FLOW SWITCH
ANNUNCIATE AT FIRE ALARM CONTROL ROOM	YES	YES	YES	YES (SUPERVISORY)	YES (SUPERVISORY)	YES (SUPERVISORY)	YES (SUPERVISORY)	YES
ANNUNCIATE AT 24 HR. ATTENDED REMOTE LOCATION	YES	YES	YES	YES (SUPERVISORY)	YES (SUPERVISORY)	YES (SUPERVISORY)	YES (SUPERVISORY)	YES
ACTIVATE AUDIBLE/VISUAL ALARM SIGNAL ON THROUGHOUT	YES	YES	YES	NO	NO	NO	NO	YES
SHUT DOWN ALL AIR HANDLING EQUIPMENT	NO	NO	NO	YES	NO	NO	NO	NO
RELEASE ALL ELECTRO-MAGNETICALLY HELD DOORS	YES	YES	YES	YES	NO	NO	NO	NO
ACTIVATE SPRINKLER BELL AT SPRINKLER RISER LOCATION	NO	NO	NO	NO	NO	NO	NO	YES
RECALL ALL ELEVATORS SERVING FLOOR OF ALARM	NO	NO	NO	NO	YES	NO	NO	NO
CLOSE SMOKE/ FIRE DAMPERS THROUGHOUT THE BUILDING	YES	YES	YES	YES	NO	NO	NO	NO