



COLTON FIRE DEPARTMENT

303 East E Street, Colton, CA 92324
909.370.5553

Fire Alarm, Water Flow Alarm, & Signaling Systems

SCOPE

The 2019 California Building Code (CBC) and California Fire Code (CFC) specify where the systems are required. These codes and the 2016 National Fire Protection Association Standards (NFPA) apply to the design, installation, operation, testing, and maintenance of the systems.

PURPOSE

The purpose of this guideline is to facilitate the design and installation of these systems. The codes require plans (shop drawings) be submitted for review and approval by the City of Colton Fire Department (CFD) for new, rehabilitated and modified systems, prior to installation.

PLAN SUBMITTAL REQUIREMENTS

Submit three sets of scaled plans. The plans/shop drawings shall contain the following information, when any of the sections involve this project.

1. Within the CFD notes, the occupant history, central station and device count information for new, relocated and replaced devices, shall be filled-in by the designer.
 - A. Copy the completed, "Fire Alarm, Water Flow Alarm & Signaling Systems" notes, on the plans.
2. Scope of Work Statement; Include all of the following information in the scope of work, on the plans:
 - A. Indicate type of system proposed: (Notification, initiating, water flow monitoring, etc.).
 - B. Describe in detail:
 - 1) The limits of the work for this specific set of plans.
 - 2) Describe the reason when modifying an existing alarm or water flow system.
 - C. State the CBC Occupancy group from the approved building department architectural plans. (Contact the project architect).

- D. State if you are you proposing a system or specific devices that are not required by codes (and/or) if you are applying current codes that are designated for new buildings into a tenant improvement project.
 - E. Identify the occupant load on the first floor and that above the first floor.
3. Design, Coordination, and Installation Information: (Provide all)
 - A. Designer's name, license number and phone number.
 - B. Coordinator of design/install name and phone number.
 - C. Installing contractor's C-10 License number.
4. Project Identification: Complete address of the project (include building names/numbers, suite numbers, and tract and lot numbers for residential projects).
5. Device Data Sheets: Provide one set of device manufacture data sheets for all devices. Highlight the specific model and power consumption requirements.
6. Completeness of Shop Drawings: Provide a scaled floor plan (no smaller than 1/16" =1') showing the location of all devices involving your scope of work. Label all areas that are not part of the job scope. Shop drawings shall meet the requirements of 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 use for each room, terminal and circuit identification, power supplies, and any other information needed to demonstrate the function of the system. Drawings shall use the symbols identified in NFPA 170.
7. Equipment Legend/Bill of Materials. The legend shall indicate newly added, relocated, and replaced devices. (This shall match the device count on the CFD notes). The legend shall also provide device symbols, manufacturer name, model number, and the California State Fire Marshal listing numbers.
8. 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 fire department would initially respond to or is in an area that may be difficult to gain access to. The annunciator should be placed in or near the front lobby or entrance area. In multi-tenant suites, locate the annunciator in the lowest numbered/lettered suite or the lowest street address. The FACU should be within a secure environment, electrical, mechanical, service, or riser room which is best accessed from the exterior of the building. For scenarios involving multi-buildings and subsystem fire alarm control units (Subpanels): When the FACU is located in one building and a subpanel is located within another building(s), the FACU shall reset automatically when a subpanel is reset. On the contrary, the FACU shall not reset any subpanel. (NFPA 72 Section 23.8.2.9.)

9. 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 the voltage drop included in the fire alarm control panel specifications, whichever is less. Standby battery calculations shall include both standby and alarm conditions. Calculations are to be performed for 100% of the load. Any non-fire related security device load shall be included. A Minimum 20% safety margin above the calculated amp-hour capacity is required. The batteries shall maintain the system in stand-by mode for 24 hours in a non-alarm condition, and then immediately be able to operate all devices for 5 minutes. (15 minutes for voice evacuation systems). (NFPA 72 10.6.7.2.1, CFC 907.1.2)
10. Automatic Fire Extinguishing Systems: Where a building fire alarm or monitoring 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)
11. Single Path Dialers or Two Phone Lines: Only dialers listed as a single path of communication by the California State Fire Marshal are acceptable. Provide a cut sheet from the manufacturer indicating this approval. When changing the types of communication path to meet the requirements of two phone lines, you can propose a cellular phone or an internet line as the primary signal line, and a hard wired plain old telephone system (POTS) land line can only be used as the secondary line. The two POTS lines can still exist if still operable, when no change is proposed to the communication paths. (NFPA 72 Section 26.6.3.3, 26.6.3.4)
12. Elevator Recall/Shutdown: New elevators that have a travel rise that exceeds 80 inches will require Firefighter Emergency Operations (FEO) recall/shutdown.
 - A. Ensure to include all related actions from Bulletin 05-16 into the sequence of operations on the plans. If the project has an elevator that exceeds 80 inches of travel rise, insure that the system meets all the requirements specified below and copy the following onto the plans:

Under the heading **ELEVATOR NOTES** place the following verbatim:

Phase One Automatic and Manual Recall:

- Phase One cab recall to a predetermined floor level needs to be automatically activated by the hoistway, machine room, or elevator lobby smoke detectors; and elevator pit water flow switch signals, when installed (NFPA 72 conditions of the exception must be met).
- Phase One recall shall also be designed for firefighters to activate manually, by using a key switch located at the elevator lobby, annunciator key pad and/or fire alarm control panel.

Phase Two Manual Recall Key Switch Operation:

- Phase Two recall overrides Phase One and is manually activated from inside the cab by using a key switch. Firefighters are required to press and hold buttons to command the elevator operations. Firefighter's Hat Lamp and Sounder Indications during Phase One and Phase Two Recall:

- Phase One activation in the cab causes the firefighter hat lamp to glow, and a sounder to activate.

- Upon smoke detector activation within the elevator hoistway or machine room, the Firefighter's hat lamp in the cab will change from a steady glow to flashing off and on. This alerts firefighters to exit the cab and not use the elevator(s) for FEO.

Heat Detector and Power-Shutdown (Shunt Trip Mechanism):

- Heat detector(s) in the machine room shall activate first to prevent sprinkler head activation.

- Hoistway Heat detector(s) are only required when sprinkler system water would damage elevator related equipment enough to make the elevator unsafe to use.

- Heat detector activation shall cause a shunt trip mechanism to shut down the power to the elevator(s) to prevent FEO usage completely, to ensure firefighter safety.

Smoke Detection:

- Smoke detectors are not allowed in the hoistway without sprinklers present.

- If the elevator lobby, hoistway, or machine room detectors are only dedicated to activating recall, then the signal is supervisory and therefore does not cause building evacuation.

- Unless codes specifically require a smoke detection system, common area detectors, door holders, or duct detectors just activate a supervisory signal. Other circumstances identified during plan review may be allowed for common area detectors to cause building evacuation and/or emergency response.

Associated Alarm Devices and Panel Operations:

- Manual pull boxes do not recall elevators unless mandated by CFD during plan review. Manual pull boxes shall cause evacuation and an emergency response.

- Dedicated recall devices shall be connected to the fire alarm or water flow panel. If there is no fire alarm or water flow panel, a dedicated stand-alone and signed recall panel is required to be installed.

13. Duct Detection: Duct detectors are only required to be tied to the main fire alarm panel, when the alarm system is required by CBC 907.2. When tied to the main fire alarm panel, duct detection activation shall only cause a supervisory signal to the central supervising station. For buildings that only have a water flow alarm or buildings with voluntary alarms, the duct detector activation shall provide a visible and audible signal at an approved location but does not need to notify the central supervising station.

14. Manual Fire Alarm Boxes (Manual Pull Stations): CFD does not require a manual fire alarm box for the initiation of a fire alarm signal as permitted per CFC 907.2 Exception 3. Pull stations installed for specific reasons or specific locations may still be required or acceptable. CFC 907.4.2 Pull station covers or their sounding devices will be evaluated on a case by case basis and shall be subject to CFD approval during the plan review. (CFC 907.4.2.5)
15. Alarm devices related to special door egress and access controls:
Plan Review and Inspection Timing Sequence Requirements:
- A. The fire alarm designer shall provide to CFD a separate copy of the approved architectural plans for the areas in which the special door egress and access controls are proposed.
 - B. The related alarm component plans shall be approved by CFD prior to the installation of special door egress and access controls.
 - C. The alarm panel related components shall be installed and inspected, prior to or concurrent with the installation of special door egress and access controls.
16. Hazardous Materials Warning Systems: All emergency warning systems for hazardous materials emergency initiations shall have visual notification appliances that are blue in color. Audible devices shall be of a different tone and pattern than the notification alarm system. (CFC 5004.9 and 908).
17. Occupancy Group E Specific Information: Emergency voice alarm communication systems are required when the final approved occupant load exceeds 100 occupants, when a fire alarm is installed. (CBC 907.2.3). In these cases, the alarm plans cannot be approved until the architectural plans are approved. Smoke detection shall also be installed in every room used for sleeping or napping. (CBC 907.2.3.9.2)
18. Occupancy Group R-2 Specific Information: Dwelling and sleeping units shall be provided with the capability to support future visible alarm notification appliances. (CBC 907.5.2.3.3) This is required only when a fire alarm is required by CBC 907.2.9.1, such as when the building has 17 or more units, four or more floors, or there are dwelling/sleeping units located below the level of exit discharge. However, see Section 907.2.9.1 to find more scenarios and exceptions requiring a fire alarm.
- A. See CBC 907.5.2.3.3 for multiple different ways to provide the capability to support future visible alarm notification appliances. One acceptable example is as follows:
 - 1) In lieu of actual pre-wiring for visible devices within the unit, provide approved electrical conduit installed in all units with suitable junction boxes and direct termination at the fire alarm control unit location. (CFD does not require pre-wiring within units and future damage to walls to install wiring later, is the choice of the builder at the time of construction).

- 2) Fire alarms in these buildings have more requirements in addition to visible appliance capabilities in dwelling/sleeping units. See (CBC 907.5.1 through 907.5.2.3.4).
19. Sequence of operations for all systems: See the example below. Match the sequence you are proposing, to the sequence and signal types we provide you. Contact us prior to submittal if there is a discrepancy.

Example Sequence of Operations

(Differences may be approved on a case by case basis)

Emergency Response and Alarm Condition: (List both of these in separate rows)

Audible and Visual Notification System

Area Smoke and Heat detectors

Sprinkler Head Activation

Special Extinguishing System

Manual Pull Station

Supervisory Signals

Elevator Recall Devices in Lobby, Machine Room, or Shaft

Duct Detectors

Valve Tamper Signals

Door Closure Devices (unless for required area detection)

Power Failure

Generator, Fire Pump, Water Tank

Elevator Recall Signals

Firefighter Hat Lamp in Elevator Cab Glows:

- Elevator Lobby Smoke/Heat Detectors
- Recall Key Switches

Firefighter Hat Lamp in Elevator Cab Flashes:

- Machine Room or Hoist-way Smoke/Heat Detector

Under the heading **Colton Alarm Note**, first complete the bottom portion and then copy the following notes on the plans verbatim:

1. CFD inspections are required for this project. Please schedule all inspections at least 72 hours in advance. Call CFD 909-370-5553 to schedule inspection.
2. The scope of work shall be tested by the installer prior to the CFD inspection to determine the system properly functions as approved on the plans.
3. For extremely large systems, CFD may require the installing contractor to provide a written certification by a different third-party licensed contractor, to verify all or specific portions of the system function as approved on the plans. (NFPA 72, 7.5.2)
4. This system was designed and installed under the 2016 code requirements.
5. Approved drawings and documents shall be retained. Drawings shall be accessible upon request. After final inspection, approved shop drawings and maintenance instructions shall be properly delivered to a representative of the occupying business, who shall offer copies to the building owner. (NFPA 72, 7.5.3 and 7.7.1)
6. Written records and reports of the alarm system testing frequencies and results shall be available for review on the premises for the CFD inspector during fire inspections.
7. Testing and service personnel shall be qualified and experienced per NFPA 72, 10.5.3.
8. Any future modifications to the system after this final CFD inspection shall cause a new plan to be drafted and submitted by the tenant or building owner. The modifications shall not be started until the new plans are approved by CFD. (NFPA 72, 7.5.6.6)
9. When the Fire Alarm Control Unit (FACU) panel is in a room accessed through a door, a permanent sign shall be provided on the door indicating, "Fire Alarm Control Unit" or equivalent. When there are sub-panels, door signs shall also indicate where the main FACU panel is located.
10. A 24-hour emergency response phone number shall be permanently posted at the control panel.
11. The circuit breaker power disconnect shall only be accessible to authorized personnel and shall be identified as "FIRE ALARM". (NFPA 72, 10.6.5.2) The electrical panel with the fire alarm circuit shall be in a secure room, or a circuit breaker locking device shall be installed (NFPA 72, 10.6.5.4)
12. Storage batteries shall be marked with the month and year of manufacture. (NFPA 72, 10.6.10)
13. The batteries shall be able to run the system in stand-by mode for 24 hours without building power in a non-alarm condition, and then immediately be able to operate all devices for 5 minutes. (15 minutes is required for voice evacuation systems). (NFPA 72, 10.6.7.2.1, CFC 907.1.2)
14. If a 24-hour battery test was not required, CFD could require shut down of the AC power to verify trouble signals.
15. Batteries shall be fully charged under normal conditions and after a power loss event discharge. (NFPA 72, 10.6.10.3)
16. A battery charger failure shall be detected as a trouble signal. (NFPA 72, 10.6.10.6.1)
17. An alarm signal shall occur within 10 seconds after initiating device activations (NFPA 72, 11.11.1) The alarm signals shall be audibly distinctive from all other different types of audible systems or alarms. (NFPA 72, 10.10)
18. All audible alarm notification signals shall be a three-pulse temporal pattern. (CFC 907.5.2.1.3)
19. Audible alarm sound pressure levels shall be provided as specified by CFC 907.5.2.1. and 907.5.2.1.2
20. When more than two visual notification appliances are located within the same room or area, they shall be synchronized. (NFPA 72, 18.5.5.4.2)
21. Manual pull station key(s) should be placed in the main FACU box or sprinkler head box.
22. When tied to the main fire alarm panel, duct detector activations shall only cause a supervisory signal to the central supervising station.
23. Inspection, testing and maintenance shall be performed and maintained per Chapter 14 of NFPA 72 and the manufacturer specifications.

24. Where a building fire alarm or monitoring system is installed, automatic fire-extinguishing systems shall be monitored to the central supervising station by the building fire alarm or water flow system in accordance with NFPA 72 and CFC 904.3.5.
25. Elevator recall shall operate per the signals found in sequence of operations on this plan. (NFPA 72, 21.3)
26. All fire alarm and water flow alarm systems undergoing a change in central supervising station companies are required to be immediately tested in the presence of Colton Inspector. This is to verify that new company is appropriately receiving necessary signals, transmitting emergency 911 communications, and that devices dedicated for supervisory and trouble signals do not cause an emergency response.
27. The following must be completed by the designer prior to copying on the plans. List the number of all total devices proposed only for this specific job.

This scope of work only covers the following quantity of devices:			
Devices below are factored in fee charges			Devices not factored in fee charges
List the # of Initiating Devices below:			List the # Other Devices below:
<u>Detectors</u>	<u>Duct Detectors</u>	<u>Manual Pull</u>	<u>Tamper/Water Flow</u>
New/Added:	New/Added:	New/Added:	New/Added:
Relocated:	Relocated:	Relocated:	Relocated:
Replaced:	Replaced:	Replaced:	Replaced:
List # of Notification Devices below:			<u>FACU</u>
<u>Horns / Strobes</u>			New/Added:
New/Added:			Relocated:
Relocated:			Replaced:
Replaced:			(Indicate) Dialer Replaced Yes / No
			Extinguishing System Yes / No

(The Information Above Shall Match the Equipment Legend/Bill of Materials).

Occupant History and Background: (Provide the information underlined on each below.)

- i. Approximate age of the building? (In Years) _____.
- ii. Occupant will be new to the building? Yes / No.
- iii. Number of floors this occupant will occupy. _____.
- iv. Occupant is already existing in the building. Yes / No.
 If occupant is existing, list the approximate amount of years occupied _____.
 - Occupant will be occupying an additional floor. Yes / No.
 - Occupant is staying on the current floor level, and occupying new area? Yes / No.

U.L. Listed Central Supervising Station Facility (CSSF) Information:

The CSSF Name: _____ Phone Number: _____
 CSSF Address: _____