

## Fire Alarm Systems

### 1. PURPOSE

The intent of this guideline is to facilitate the design, installation, and consistent review of fire alarm and dedicated function systems. The Santa Clara Fire Department (SCFD) has established the following requirements for the submittal of the plans.

### 2. PERMIT REQUIRED

Construction Permit(s) are required to install or modify systems and equipment that are regulated by the California Fire Code (CFC). **No work shall commence prior to the approval of plans and the issuance of a permit.** Permits are required for the following.

- Installation of a new system
- Alteration to an existing system
- Addition to an existing system
- Demolition of a part or of a whole system
- Relocation of panels (such as FACU, Pre-Action Systems, Clean Agent Systems, etc.)
- Emergency Replacement of a system (Approved Fire Watch is required while the system is being replaced and until the Permit is finalized)

### 3. APPLICABLE CODES & STANDARDS

- Health & Safety Code Section 13145
- California Code of Regulations (CCR), Title 19
- CCR, Title 24, Part 2: 2016 California Building Code (CBC)
- CCR, Title 24, Part 3: 2016 California Electrical Code (CEC)
- CCR, Title 24, Part 4: 2016 California Mechanical Code (CMC)
- CCR, Title 24, Part 9: 2016 California Fire Code (CFC)
- National Fire Protection Association (NFPA) 72 National Fire Alarm Code, 2016 edition, as amended in Chapter 80 of the 2016 CFC
- City of Santa Clara Amendments and Guidelines.

The design, installation, inspection, operation, testing and maintenance of all fire protection systems shall be in accordance with Chapter 9 of the CFC. The 2016 California Building Standards Code (Cal. Code Regs., Title 24) was published July 1, 2016, with an effective date of January 1, 2017. The codes can be accessed at <http://www.bsc.ca.gov/Codes.aspx>

### 4. GENERAL REQUIREMENTS

- A. Submit a completed SCFD Permit Application, which can be obtained at the Fire Marshal's Office, located at 1675 Lincoln Street, Santa Clara or on the City of Santa Clara website at <http://santaclaraca.gov/government/departments/fire/fire-permits-guidelines>

- B. Submit appropriate fees – Please reference SCFD Plan Check Fees document.
- C. Submit (3) sets of legible, scaled plans with (3) sets of current and complete technical data sheets.
- D. The Fire alarm plans shall be provided on **1/8" = 1'-0"** scale. Metric scale shall not be accepted.
- E. The plans shall be a maximum 30" x 42".

## 5. PLANS

***Plans not conforming to these minimum requirements will be returned as incomplete.***

- A. Design shall be in accordance with NFPA 72, CFC 907 & SCFD Guidelines.
- B. Plans and attachments shall be clearly labeled and legible. SCFD requires CAD drawings and does not accept hand drawn or handwritten plans. Plans shall be presented per nationally recognized standards. Plans submitted in color shall use line types and wiring tags/labels such that the information is retained when plans are scanned and copied in black/white or gray scale.
- C. Plans and all revisions to the plans shall be dated. If utilizing an existing drawing, the area of work shall be highlighted and clouded with an appropriate symbol (delta). Provide a revision list with a symbol, date, description, and initials.
- D. For all "Tenant Improvement," "Market Ready" and "Panel Replacement" projects etc., **complete** floor plans and system riser diagrams shall be provided on the plans. FACU Battery calculations, Remote Power Supply Battery calculations, and Voltage Drop calculations shall be revised and updated. Partial floor plans and riser diagrams shall not be acceptable ***unless otherwise approved by SCFD***. All existing devices and equipment shall be shown and properly identified on the floor plan and system riser diagram.
- E. Plans shall include a title sheet, an equipment list, a written sequence of operation or functional matrix, a floor plan, a system riser diagram, and secondary power & voltage drop calculations.
- F. Attachments shall include the manufacturer's specification sheets and California State Fire Marshal (CSFM) listing sheets for all equipment and devices requiring listing.
- G. Highlight one set of data sheets (style, type, model, standby and alarm currents, volts, etc.) for all fire alarm components.
- H. Clearly indicate the quantities of new and existing devices and appliances.

## 6. TITLE SHEET

The following information shall be provided on the front title sheet:

- A. **System Designer.** Provide full name (no initials, pseudonyms, acronyms, or aliases) and phone number of the facility owner and system designer on the plans. Fire protection system plans and specifications shall be developed in accordance with applicable Code by persons who are experienced in the design, application, installation, and testing of the systems. Evidence of the designer's qualifications and certifications shall be provided to SCFD, upon request.
- B. **System Installer.** Provide full name (no initials, pseudonyms, acronyms, or aliases) and phone number of the facility owner and system installer on the plans. Fire protection system installation shall be performed by qualified personnel or shall be supervised by persons who are qualified in the installation, inspection, and testing of the systems. Evidence of the installer's qualifications and certifications shall be provided to SCFD, upon request.

- C. **Permit Applicant.** The permit applicant shall be the system installer. All installing contractors shall have a California Electrical (C-10) Contractor's License, a valid worker's compensation certificate, and a city business license. Provide the Business name, address, and California Contractor's License number of the installing contractor on the plans. When the design and plans are produced by a party other than installing contractor, the plans shall be stamped by a Professional Engineer. The system designer and system installer shall be clearly identified on the plans.

The designer of record and the system installer shall be responsible for the entire system.

- D. Business name and address of the building(s). Provide complete address of the building(s), including the suite #'s, where applicable. Confirm addressing with Community Development.
- E. **Scope of work.** Provide a clear and descriptive narrative of the scope of work. Mention the type of fire protection system (Manual or Automatic Fire Alarm System w/w.o. Voice Evacs, Sprinkler Monitoring System, etc.) & type of work (New system, Tenant improvement, Market Ready etc.). **Merely stating Demo, TI or Market ready and/or simply listing the quantity of devices/appliances is not acceptable.** Clearly indicate in the Scope if the system or work performed is Voluntary. When a fire alarm system or component is voluntarily installed, it shall meet all the requirements of NFPA 72. If the scope of work is the demolition of an existing F/A system or components, justification for removal shall be provided. **Note:** Do not remove smoke detectors or any other systems, even when installed voluntarily, without prior approval and permitting by SCFD.
- F. Provide a clear site map and a vicinity map. A key plan of the building and/or complex indicating the street location and the area of work within the building shall be provided.
- G. A note stating that the design and installation complies with the applicable Codes and Standards. See [Section 3](#).
- H. Provide a Bill of Materials/Equipment List. Clearly indicate **both the existing and new quantities** added or removed. Provide the model number, manufacturer's name, description, CSFM listing number, and symbols to be used (legend) for each device, equipment, and conductors proposed to be installed. **Note:** The Fire Department reserves the right to disallow any listed product due to past performance.
- I. All plans and shop drawings shall use the symbols identified in **NFPA 170**, *Standard for Fire Safety and Emergency Symbols*. The symbols used on the plans shall match the legend. Strike out any "typical" symbols that do not pertain.
- J. Any other pertinent notes required to evaluate the design of the fire protection system.

**Provide the following table verbatim on the plans and complete each item.**

		<b>Provide the following information</b>
1.	Business Name	
2.	Address (include Suite # when applicable)	
3.	Detailed Scope of Work (See Section 6E)	
4.	New Construction or Market Ready or Tenant Improvement?	
5.	Building Permit # associated with Scope of Work	
6.	System - Required or Voluntary?	
7.	Applicable Codes and Standards	
8.	Type of System For example, Manual or Automatic Fire Alarm System w/w.o. Voice Evacs, Sprinkler Monitoring System, etc	
9.	# of Stories above grade/below grade	
10.	Building Height	
11.	Total Building Area	
12.	Area of TI work	
13.	Occupancy Group(s) in the Building	
14.	Occupancy Group(s) in area/suite of work	
15.	Total occupant load of the building	
16.	Occupant load of the area/suite of work	
17.	SCFD approved Alternate Materials and Methods?	(Yes / No) Provide Permit #
18.	Automatic Sprinklers provided?	(Yes / No)
19.	Phased Occupancy planned?	(Yes / No) Provide Permit #
20.	Central Station Name, Address, Phone # and UUFX # (2016 NFPA 72 Section 26.3)	

## 7. FLOOR PLANS

The following shall be clearly indicated on the floor plans:

- A. Complete floor plans shall be provided for the entire building unless otherwise approved.
- B. Scale used and a graphical representation of the scale. The Fire alarm plans shall be provided on **1/8" = 1'-0"** scale. Metric scale shall not be accepted.
- C. The locations of partitions, non-rated walls, and rated walls. If not full height, indicate the heights of the wall.
- D. The location of all equipment, devices, annunciators, and appliances (including fire sprinkler control and test valves, fire smoke dampers, air handler units, magnetic door holders, etc.) and end-of-line devices.
- E. The candela rating of each strobe.
- F. The design minimum audibility level for occupant notification. Design documents shall include expected average ambient sound pressure levels and audible design sound pressure levels in all rooms of the building in accordance with NFPA 72, Section 18.4.1.4.3.
- G. Use of each room or space based on approved architectural plans.
- H. Room #'s based on approved architectural plans.
- I. Type of ceiling or roof construction, i.e., smooth, solid joist construction, beam construction, and/or sloped ceiling. Indicate the heights of the ceiling. Provide the location, size, depth and distance between beams and scaled cross-sections and/or elevation-plans.
- J. Provide the wiring schedule. Provide the number of conductors in each wiring segment and the type and size of wire or conductor to be used. The class and style for initiating, signaling line and notification device circuits.
- K. The address for all devices, appliances, and any other fire alarm components.

## 8. RISER DIAGRAM

The following shall be clearly indicated on the Riser diagram:

- A. **Complete** riser diagram shall be provided for the entire building unless otherwise approved.
- B. Riser diagram shall show the interconnection of each device and equipment of the whole system.
- C. Candela rating of each strobe and the audibility setting/wattage of the horns/speakers.
- D. Number of conductors in each wiring segment and the type and size of wire or conductor to be used.
- E. The class and style for initiating, signaling line and notification device circuits. As well as circuit number or identification.
- F. The address for all devices, appliances, and any other fire alarm components.

## 9. SEQUENCE OF OPERATION MATRIX

- A. Provide a Sequence of Operation matrix that defines the events that occur when various initiating devices are activated. The description shall include details relating to annunciation, evacuation warning, remote signaling, and activation of fire safety control functions, as applicable. See NFPA 72 Figure A.14.6.2.4 for a typical matrix layout. Also provide the sequence of operations that identifies the required action for the actuation of any other ancillary systems/devices tied into the fire alarm system. Refer to [Section 12B](#) for examples.
- B. Provide the approved smoke control report/letter and smoke control matrix on the plans, when the building has a smoke control system.

## 10. CALCULATIONS

- A. **Battery calculation** - The secondary power supply shall have sufficient capacity to operate the fire alarm system for a minimum of 24-hours and, at the end of that period, shall be capable of operating all alarm notification appliances for at least 5 minutes (or 15 minutes if an Emergency/Voice Communications System (EVACS) is installed).

Battery calculations shall include a minimum 20 percent safety margin above the calculated amp-hour capacity required. Calculations are to be performed for 100% of the load. Provide exact battery calculations per the quantity of devices. **Do not use maximum capable capacity in the calculations.**

- B. **Voltage drop calculation** - Calculations shall be provided to verify that the voltage drop in the alarm notification circuits is within the **operating voltage range per the listing or a maximum of 15% voltage drop, whichever is more restrictive**. To properly execute voltage drop calculations the battery should be assumed degraded 15% from 24 volts down to 20.4 volts in accordance with the 9th Edition Standards for fire alarm control panels UL 864. Use the resistance tables in the National Electrical Code to determine the resistance of the wiring. Field testing shall be with an approved voltage drop meter.
- C. Provide speaker schedule that includes power and voltage drop calculations for speaker circuits.

## 11. ATTACHMENTS

- A. Manufacturer's specification sheets for all devices, equipment, and materials to be used shall be submitted, including the transponder to the supervising station. Highlight on the cut sheet which device or equipment is being used, the listing information, and the application per listing. Highlight one set of data sheets (style, type, model, standby and alarm currents, volts, etc.) for all fire alarm components.
- B. Submit copies of the CSFM listing number sheets for all devices and equipment requiring listing.

## 12. GENERAL DESIGN REQUIREMENTS

- A. When a new system is required due to change of occupancy or CFC mandate, the premises shall be brought up to current code. When the existing system is no longer serviceable (considered maintenance repair), a new system may be installed in the same configuration to the existing layout and function, provided it does not diminish the original system's capability. The scope shall be clearly demonstrated on the plans and acceptance testing shall be the same as if the system were new. **Note:** SCFD to determine when a fire alarm system must be brought into compliance with the current code.
- B. The following auxiliary systems/signals shall be monitored by the fire alarm system.
  - Elevator Recall Control Systems
  - Pre-Action System (NFPA 13)

- Clean Agent Extinguishing (NFPA 2001)
  - Wet & Dry-Chemical Extinguishing signals (NFPA 17A, NFPA 17)
  - Gas Detection signals
  - Two-way Communication System
  - Emergency Responder Radio Coverage System (NFPA 1221)
  - Smoke Control Systems
  - Generator signals
  - Fire pump signals
  - Duct detectors
  - Battery System signals
  - Lighting Inverter signals
  - Refrigerant System signals
  - Emergency Alarm system signals
  - Egress Control Systems
- C. Where auxiliary panels (For examples, See Section 12B) are provided, the auxiliary panels must be installed in the same location as the building fire alarm control unit and be tied to the fire alarm control unit. An annunciator panel controlling the auxiliary system may be provided as an alternate to the above requirement when approved by SCFD.
- D. New buildings, market ready and tenant improvement projects shall be designed and installed in accordance with the applicable codes and standards enforceable at the time of building permit application associated with the scope of work. Voluntary systems shall be based on the applicable codes and standards enforceable at the time of fire permit application.
- E. There shall be no more than one fire alarm system in a building. Likewise, there shall be no more than one supervising station providing service to a building. Each building shall be provided with a dedicated fire alarm control unit unless otherwise approved by SCFD.

### **13. SPECIFIC DESIGN REQUIREMENTS – Occupant Notification Coverage**

- A. Provide audibility coverage in all occupiable rooms/spaces of the building. For the purposes of this requirement, normally unoccupied spaces such as mechanical rooms, electrical rooms, storage rooms, etc. are considered occupiable rooms (Occupiable rooms/spaces include any room/space equipped with means of egress, light and ventilation facilities). Visible coverage may be provided with approval from AHJ when average sound ambient noise is greater than 95 dBA.
- B. Minimum fire alarm audibility may be affected by the occupancy use or operations, some equipment may be required to be shut down by a relay. If this is needed to achieve minimum audibility levels, include on the sequence of operations matrix.
- C. Provide low frequency audible coverage in all sleeping areas per NFPA 72, Section 18.4.5.3. For the purposes of this requirement, living rooms are considered sleeping areas. Sound levels (min. 75dB or greater per NFPA 72, Section 18.4.5.1) shall be measured at pillow level in all sleeping areas. Additional audible appliances may be required in living rooms. Barriers such as doors, curtains or retractable partitions should be taken into consideration and the sound pressure levels shall be demonstrated on field with bedroom doors closed. Maximum sound pressure level permitted is 110 dBA at the sounding appliance. This language will apply to new hotel/motels, apartments and assisted living facilities.
- D. Consider ambient lighting conditions when designing the visible notification coverage. This typically applies to exterior strobes, grow rooms, modern architecture that provides lots of natural light in the interior of the building, etc. Also take into consideration the installation of pendant mounted floating lighting fixtures. Strobes shall be installed at or below the lighting fixture height for effective intensity.

- E. In market-ready (finished and occupiable) spaces, complete occupant notification coverage shall be provided per CFC 907.5 and NFPA 72. In shell (not for occupancy) spaces, minimum occupant notification coverage shall be provided to the satisfaction of the AHJ. Systems shall be designed to support future expansion, during tenant improvements.
- F. Notification zones shall be consistent with the emergency response or evacuation plan for the protected premises. The boundaries of notification zones shall be coincident with building outer walls, building fire or smoke compartment boundaries, floor separations, or other fire safety subdivisions. (NFPA 72, Sections 23.8.6.3.1 & 23.8.6.3.2)
- G. All emergency warning systems for hazardous materials shall have visual notification appliances that are blue in color. Audible devices shall be of a different tone and pattern than the fire alarm systems. An approved UL central station, remote station, or a proprietary station approved by the SCFD shall supervise these emergency alarm systems. (CFC 5004.2.5 and 908)
- H. Provide exterior weatherproof notification appliance (horn/strobe or speaker/strobe) with minimum 110cd, at the front entrance or near the sprinkler riser room, or as directed by SCFD. Additional exterior appliances may be requested by SCFD, if deemed necessary.
- I. Group R-2 Occupancies
  - (1) Per CFC 907.5.2.3.3, in Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with NFPA 72. All sleeping areas (including spaces that might reasonably be used for sleeping such as living rooms) shall be provided with the capability to support visible alarm notification appliances. Such capability shall be permitted to include the potential for future interconnection of the building fire alarm system with the unit smoke alarms, replacement of audible appliances with combination audible/visible appliances, or future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.
  - (2) Activation of an initiating device within a dwelling unit shall activate all notification appliances within that unit only.
  - (3) Activation of any alarm initiating device within a dwelling unit shall be transmitted to the central station as a supervisory signal.
  - (4) A written description of the design proposal/engineering shall be provided on plans and the sequence of operation shall reflect the future conversion. Details must be provided for future power supplies, boxes, conduit and wire. Typical floor plans of the units “before” visual appliance conversion and “after” visual appliance conversion shall be provided. The future Fire Alarm Sequence of Operation, battery calculations and voltage drop calculations shall be described in detail.
  - (5) All rough wiring is to be completed as part of the initial build out. Rough inspections shall be scheduled with SCFD before filling insulation and after electrical wiring is complete.

#### **14. SPECIFIC DESIGN REQUIREMENTS – Initiating Devices**

- A. If duct detectors are required by code, provide cut sheets demonstrating the detectors are listed for the complete range of air velocities, temperature, and humidity expected at the detector present in the duct. Duct smoke detectors shall be connected to the building’s fire alarm control unit when a fire alarm system is installed. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location and shall perform the intended fire safety function in accordance with this code and the California Mechanical Code. Duct smoke detectors shall not be used as a substitute for required open area detection (CFC 907.3.1).



Activation of the duct detector shall report as a “Supervisory” signal only at the central station. (CFC 907.2.13.1.2 Amended, NFPA 72 17.4.7 and NFPA 72 17.4.8).

- B. The location of all detectors in air duct systems shall be permanently and clearly identified and recorded 2016 NFPA 72, 17.7.5.5.4. A permanent placard placed outside the first point of access is required to indicate that a detector is accessible from that point. **P-touch labeling is not acceptable. A phenolic placard is required.**
- C. When an existing sprinkler monitored building requires a fire alarm or a fire detection system, the existing duct detectors shall be connected to the new fire alarm control unit for supervision. New or existing smoke detectors installed in ducts shall be listed for the air velocity, temperature and humidity present in the duct. (CMC 609, CFC 907.4, CFC 907.4.1.)
- D. Provide automatic fire detection in all rooms or areas that contain central control equipment (e.g., FACP, transponders, power expanders etc. CFC 907.4.1)
- E. When system smoke detectors are used in lieu of smoke alarms, the low frequency signaling requirements of NFPA 72, Chapter 18, shall be applicable.
- F. All card readers and egress control devices shall be indicated on the fire alarm plans. The code may impose additional requirements such as smoke detection throughout. (CBC 1008.1.9.7 and 1008.1.9.8, CFC 907.3.2 and NFPA 72 Section 21.9). Separate permits are required. If special egress control systems are provided in the building, the alarm contractor shall provide a copy of the approved architectural plans that demonstrate compliance with all provisions of CBC 1008.1.9.7 and 1008.1.9.8
- G. Per NFPA 72, Section 21.3.7, when sprinklers are installed in elevator pits, automatic fire detection shall be installed to initiate elevator recall. Refer to NFPA 72, Section 21.3.8 - 21.3.10 for additional requirements.
- H. **Signaling Line Circuits (SLC) Zoning** - For fire alarm systems in new construction, a single fault on a pathway connected to the addressable devices shall not cause the loss of the devices in more than one zone. Refer to NFPA 72, Section 23.6.1. Provide SLC Zoning isolation details on the floor plans and the riser diagram.
- I. Initiating devices shall be installed in a manner that provides accessibility for periodic inspection, testing, and maintenance. Typically, smoke detectors in buildings specifically designed for data centers are not readily accessible. The design team shall consider installing other detection systems such as Air sampling-type smoke detectors, etc.

## 15. SPECIFIC DESIGN REQUIREMENTS – Monitoring, Transmission and Miscellaneous

- A. The Fire Alarm Control Panel (FACP) shall be placed in an area that the fire department would respond to, typically the front lobby or within an electrical, mechanical, service, or riser room, which can be accessed from the exterior of the building and is identified by a sign indicating “Fire Alarm Control Unit.”
- B. Remote annunciator(s) shall be placed in an area that the fire department would normally respond to, typically the front lobby, or as directed by SCFD. (CFC 907.6.3.1)
- C. **Communication Method** – If available, the primary means of signal transmission from the protected premises to the central station shall be provided by a telephone line. Secondary transmission methods can include any one of the following. Both primary and secondary means of transmission shall be supervised.
  - (1) One-way private radio alarm system
  - (2) Two-way RF multiplex system

(3) Transmission means complying with NFPA 72, Section 26.6.3

As an alternate, a digital cellular unit can be used as a primary means of signal transmission. A secondary means of signal transmission is still required. Another digital cellular unit with a different cellular carrier, system employing IP Technology or Mesh network can be used as a secondary means of transmission. IP technology or Mesh network shall not be used as the primary means of transmission.

The failure to complete a signal transmission shall be annunciated at the protected premises per NFPA 72, Section 10.14.

- D. **Initiating device identification** - The fire alarm system shall identify each specific initiating device address, location, device type, and floor level. The status shall clearly indicate "Alarm", "Trouble" or "Supervisory" signal. The signals transmitted to a supervising central station shall include detailed information about the alarm at the initiating device level (Individual Point Identification Monitoring). Device identification based on "Zones" is limited to 15 alarm initiating devices.
- E. **Remote Power Supplies** - When multiple remote power supplies are installed at different locations in a building, each remote power supply shall be individually supervised for trouble conditions. If all the power supplies are located in one room, then combined supervision of all power supplies is permissible.
- F. Remote power supplies provided to power door holder circuits shall also be monitored.
- G. **Pathway Survivability** - Level 2 or Level 3 pathway survivability is required for Fire Alarm Systems employing relocation or partial evacuation. (NFPA 72 Section 24.3.13.4.1)
- H. **Fire/Smoke Dampers** - Fire and smoke dampers shall be provided with an approved means of access large enough to allow inspection and maintenance of the damper and its operating parts. The access shall not affect the integrity of the fire resistance-rate assembly. The access openings shall not reduce the fire resistance rating of the assembly. Access shall not require the use of tools. Access doors in ducts shall be tight fitting and approved for the required duct construction. Access points shall be permanently identified (**p-touch labels are not considered permanent**) on the exterior by a label with letters not less than ½ of an inch in height reading as one of the following (2016 CMC 605.5):
- Smoke Damper
  - Fire Damper
  - Fire/Smoke Damper
- I. **Phased occupancy** - When occupancy of one phase is needed prior to the completion of the entire project, a phased occupancy plan is required to be submitted to the Fire Department for approval. The phased occupancy plan must be submitted and approved prior to any occupancy request. See information about fire alarm testing in Phased occupancies in [Section 17](#) of this document.

Additional guidelines on Phased Occupancy is available at the following link.  
<http://santaclaraca.gov/government/departments/fire/fire-permits-guidelines>

## 16. SPECIFIC INSTALLATION REQUIREMENTS

- A. Wiring - General guidance:
- (1) All fire alarm cables shall conform to the requirements of National Electrical Code (NFPA 70).
  - (2) Good workmanship shall be apparent in the installation of fire alarm cables/conduits.

- (3) Fire alarm cables that are installed exposed shall be run parallel and perpendicular to the surface of the building or exposed structural members and follow the surface contours as much as practical. Fire alarm cables, whether exposed, concealed or in raceways, shall be sufficiently supported using devices intended for the purpose.
  - (4) Fire alarm cables/conduits shall be firmly secured in place, adequately supported and permanent. UL listed cable/zip ties when used to secure fire alarm cable to building members/structure, shall be of a type designed, intended and appropriate for use and complement the items with which they are used.
  - (5) Low voltage fire alarm cables (NAC and SLC) shall be adequately separated from high voltage cables.
  - (6) Fire alarm raceways (when used/required) shall be firmly and securely fastened to or supported from the building structure or a structural member or embedded in concrete or masonry. Recommended spacing of supports for vertical and horizontal raceways per NECA 1 (Standard for Good Workmanship in Electrical Construction) and/or by manufacturer should be followed.
  - (7) Painting of fire alarm wires is not a recommended practice but widely encountered. Painted wires prohibit identification of the wiring. Means shall be provided to identify the marking and listing of the painted wires to the satisfaction of the inspector. In addition, provide a letter from manufacturer indicating that the UL Listing of the painted fire alarm cable is still applicable.
  - (8) Drawings shall include the UL-listed through-penetration firestop system where conduit or wiring penetrates a rated wall or floor/ceiling assembly. In-house drawing details shall not be a substitute for the actual UL-listed assembly. In accordance with the Section 714 of the CBC the UL-listed assembly shall have an F-rating of not less than the required fire-resistance rating of the wall penetrated. UL-listed systems for floor/ceiling assemblies shall have an F-rating/T-rating of not less than 1 hour but not less than the required rating of the floor penetrated. If an exception to Section 714 is taken, that exception must be listed on the drawings. Work with the Architect of Record to ensure the proper UL-listed assembly is selected.
- B. Storage batteries shall be permanently marked with the month and year of manufacture, using the month/year format. The marking shall be permitted to be applied by either the battery manufacturer or the installer. Where the battery is not marked with the month/year by the manufacturer, the installer shall obtain the date-code and mark the battery with the month/year of battery manufacture. (NFPA 72 Section 10.6.10.1.1 and NFPA 72 Section 10.6.10.1.2)
- C. The circuit disconnect providing power to the fire alarm unit shall only be accessible to authorized personnel, and shall be identified as "FIRE ALARM CIRCUIT".

## 17. INSPECTIONS

- A. Field inspections shall be scheduled only after a permit has been issued. Inspections shall be scheduled by the permit applicant or installing contractor only. **An approved / stamped set of plans, FD conditions / comments, and permit card SHALL BE ON-SITE at all times. Inspections will NOT be performed without them on-site.**
- B. Call (408) 615-4970 at least one business day prior to the desired date of the inspection. Inspections are assigned on a first come first served basis. The inspection request line is open Monday through Friday between 8:00 a.m. and 5:00 p.m.
- C. For residential occupancies and for new high rises, call for rough wire inspection. No covers or insulation shall be provided until SCFD inspections are complete. The building electrical wiring shall be complete before scheduling for rough fire alarm wiring inspection.

D. **Pre-test Reports:** Pre-Test Report from Central Station shall be provided to the SCFD before commencing inspections. Inspection will not be done without the Central Station report and shall be considered as missed inspections.

- (1) The monitoring account shall be an active account with the Central station at the time of SCFD Inspections.
- (2) The descriptions of the Alarm, Trouble and Supervisory signals on the FACU generated Points List and the Central Station Pre-Test Report should be exact (or as close as possible, to the satisfaction of the fire code official). The descriptions of the initiating devices shall be meaningful and shall provide the room/area/space name, number, location, floor, direction, etc. The goal is to provide accurate description so that the fire department has the best possible information when responding.
- (3) The central station report shall provide the type of alarm and supervisory initiating devices (such as manual, automatic, sprinkler waterflow, sprinkler tamper, fire-pump supervisory, etc.)
- (4) Clearly highlight all the “Alarm” and “Supervisory” signals (and not the “Restoral” Signals) on the Central Station Pre-Test Report.

E. **Fire alarm testing**

- (1) In projects involving replacement of the fire alarm panel, the fire alarm contractor shall pretest 100% of the devices and provide a pre-test report from the central station as indicated above. SCFD will test at least 10% of the devices. The building tenants shall be notified in advance of the testing.
- (2) Fire alarm testing in Phased Occupancies can be very complicated. The fire alarm contractor and the general contractor shall clearly provide the phased occupancy plan for SCFD's approval and create a binder to track the inspections for each phase. At the time of final Fire Clearance for the Certificate of Occupancy, 10% of the devices will be retested in the entire building. The building tenants shall be notified at the time of leasing and in advance of the final SCFD testing.

F. The installing contractor shall conduct a complete test of the system and shall provide a “Record of Completion” (Figure 7.8.2 of 2016 Ed of NFPA 72). Older versions of the Record of Completion are not acceptable.

G. Three (3) copies of the completed “Record of Completion” shall be required. Provide a signed copy to SCFD, a copy to the owner and a copy shall be provided in the Documentation Cabinet located at the premises.

H. All previous records of inspections, correction notices shall be provided upon request.

I. There shall be a minimum of two technicians. One technician will be at the fire alarm control unit while the other will be testing the devices. Two-way radios shall be provided and the technician at the panel shall communicate to the inspector which devices are activated on the panel.

J. It is the responsibility of the permit applicant or listed contractor to have a representative on the job site during the inspection with a set of approved plans. Failure to do so will result in the cancellation of the inspection and a re-inspection fee will be assessed. Necessary coordination shall be made such that representatives of other contractors (Refer to [Section 12B](#)) whose equipment are involved in the testing are present (i.e., fire/smoke damper, air handlers, elevator, fire pumps, emergency generators, ERRCS, 2-way communication systems, etc.).

- K. After the successful completion of the tests/inspections, provide the following to the inspector:
- (1) For central station service systems, a copy of the listing organization's certification that the installation complies with NFPA 72 or a copy of the placard from the listed central station certifying that the installation complies with NFPA 72.
  - (2) Electronic As-built plans and Record of Completion shall be e-mailed to the inspector.
  - (3) The permit card (for inspector's signature).
- L. After completion and final acceptance of the project, the contractor shall provide the following to the owner:
- (1) All literature and instructions provided by the manufacturers describing proper operation and maintenance of all devices and equipment.
  - (2) A copy of the approved plan and as-built plan, in documentation cabinet in control room.
  - (3) A copy of the Record of Completion, and the signed and finalized permit card.
  - (4) Record copy of site specific software (in USB) in accordance with NFPA 72 Section 7.5.7 and 14.6.1.2

## **18. SMART PERMIT INFORMATION SYSTEM**

The City of Santa Clara offers you the opportunity to check the status of your fire permits on-line. To access the Smart Permit Information System, please log onto the system at:

[https://smartpermit.santaclaraca.gov:8443/apps/cap\\_sc/#/lookup](https://smartpermit.santaclaraca.gov:8443/apps/cap_sc/#/lookup)

You can search the system using your Case Number (For Example FIR2019-12345), Project Name, Applicant Name or the address of the project.