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FIRE PREVENTION DIVISION
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MILPITAS FIRE DEPARTMENT
EMERGENCY RESPONDER COMMUNICATION COVERAGE SYSTEM

Effective: January 1, 2023

SCOPE

This standard applies to the installation of an emergency responder communication coverage system, whether required by the California Building Code, local ordinance, or as an approved Alternate Method of Compliance thereto. Unless otherwise identified code references herein are to the 2022 edition of the California Fire Code (CCR Title 24, Part 9)

DEFINITIONS

Alternate Method of Compliance: An approved method of compliance that, in the opinion of the Fire Department, meets the intent of the provisions of the California Fire Code.

CFC: 2022 California Fire Code, California Code of Regulations, Title 24 Part 9

COUNTY 9-1-1: Shall refer to the County of Santa Clara Communications.

NFPA 1221: Shall refer to the National Fire Protection Association Standard 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition).

NFPA 72: Shall refer to the National Fire Protection Association Standard 72 – National Fire Alarm and Signaling Code (2022 Edition).

MFD: Shall refer to the Milpitas Fire Department.

SCCC: Shall refer to the Santa Clara County Communications.

SVRCS: Shall refer to the Silicon Valley Regional Communication System.

SVRIA: Shall refer to the Silicon Valley Regional Interoperability Authority.

SYSTEM: Shall refer to the Emergency Responder Communication Coverage System

REQUIREMENTS

I. **Emergency responder communication coverage in new buildings.** Approved communication coverage for emergency responders shall be provided within all buildings meeting any one of the following conditions:

A. There are more than 3 stories above grade plane (as defined by the Building Code Section 202);

B. The total building area is 30,000 square feet or more;

C. The total basement area is 5,000 square feet or more;

D. Where required by the fire code official and communication coverage signal strength levels are not consistent with the minimum levels set forth in CFC Section 510.4.1.

Exceptions:

1. Where a wired communication system is approved by the fire code official in accordance with Section 907.2.12.2 of the California Fire Code, in lieu of an in-building, two-way emergency responder communication coverage system in accordance with section 510, it shall be permitted to be installed or maintained in lieu of an approved communication coverage system. When this option is implemented, a fire command center, per CFC Section 508 and separation in accordance with CFC Section 508.1.2 as amended by Milpitas Municipal Code V-300-2.64 shall be required.

2. Where it is determined by the fire code official that the communication coverage system is not needed.

3. In facilities where emergency responder communication coverage is required and such systems, components or equipment have been proven to conflict with normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder communication coverage system.

4. Buildings and areas of buildings that have minimum communication coverage signal strength levels of the SVRIA P25 Phase 2 700 MHz Digital Trunked Radio System throughout the building, in accordance with CFC Section 510.4.1 and signal strength of -95 dB, without the use of an indoor communication coverage system.

The communication coverage system shall be installed and maintained in accordance with this Standard and with the applicable provisions of 2019 NFPA 1221, *Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems*.

The coverage shall be based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

II. Obstruction by new buildings. No obstruction of the public safety system backhaul shall be allowed without an approved mitigating plan.

III. Existing Buildings. Existing buildings other than Group R3 that meets any of the condition in Section I, that do not have approved communication coverage for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:

A. Where an existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with CFC 510, exception 1.
B. Within a timeframe established by the adopting authority.
Exception: Where it is determined by the fire code official that the communication coverage system is not needed.

To establish that the communication coverage system is not needed, a benchmark test report and pass-through document from County Communications Radio Shop shall be provided by the owner or the designated owner's representative. The benchmark test shall be conducted by a Fire Department approved 3rd Party Testing Contractor to perform complete benchmark test meeting applicable provisions of Section V item H sub-items 1-3 and Section IX items 3-11. The benchmark test shall be coordinated with the Santa Clara County Communications Radio Shop two weeks in advance.

IV. Permits

A. Permit required. A construction permit for the installation of or modification to emergency responder communication coverage systems and related equipment is required as specified in Section 105.6.4 of the 2022 California Fire Code.

Maintenance performed in accordance with this code is not considered a modification and does not require a permit. A frequency change made to an existing system is new construction and will require a construction permit.

An operational permit is required by the authority having jurisdiction to maintain an emergency responder communication coverage system.
Buildings with existing emergency responder communication coverage that did not perform optimization test in accordance with section VII of this guideline shall be optimized. During the annual maintenance testing, the owner's maintenance contractor for emergency responder communication coverage system shall contact the County Communications Radio Shop to perform ten percent optimization test per Section VII of this guideline.

B. Prior to permit application, a third-party contract with a Fire Department approved consultant shall be secured. Contact the Fire Department for a list of approved consultants.

C. **California registered professional.** The plans and specifications shall be wet stamped and signed by a California professional engineer or architect per the California Business and Professional Code Sections 5538 and 6745, in addition to a valid FCC registered licensee.

D. **SVRIA system registration.** Prior to issuance of a construction permit, systems must be registered with the SVRIA and proof of registration shall be submitted to the fire code official upon plan submittal. After the BDA system installation and final optimization is complete, the SVRIA registration document must be completed with post installation data and submitted to the fire code official prior to final acceptance.

V. Plans

A. General Requirements

1. Plans and attachments shall be clearly labeled and legible.

2. Plans and all revisions to the plans shall be dated. If utilizing an existing drawing or portion of a 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.

3. When making alterations, additions, or deletions to an existing system, all existing devices and equipment shall be shown and properly identified on the floor plan and system riser (single line) diagram.

4. Plans shall include a title sheet, an equipment list, a written standard operating procedure, a floor plan, a system riser diagram, and secondary power calculations. See Title Sheets section herein.

5. Attachments shall include the manufacturer's specification sheets for all equipment and devices such as cables, amplifiers, UPS, batteries and antenna, indicating the FCC certification. See Attachments section herein.

   Note: Failure to provide any of the information required will result in plans being disapproved.

B. Title Sheet

1. The front sheet shall contain the following information:

   a) Project name and address of the project.

b) The designer's full name (no initials, pseudonyms, acronyms, or aliases) FCC License number and signature. The designer of record shall be responsible for the entire system being proposed.

c) Business name, address, and California Contractor's License number and FCC issued License of the installing contractor. If the designer of the ERCC system is not the installing contractor, the following shall be clearly indicated/printed on the plans:

   i. **DESIGNED BY** – followed by the designer's business name, address, designer of record's fill name and signature and FCC license. See CFC 510.5.3 for qualifications.

   i. **LEAD TECHNICIAN** - followed by the lead technician name, address, and FCC license. See CFC 510.5.3 for qualifications.

   i. **INSTALLING CONTRACTOR** – followed by the installing contractor's business name, address, and California Contractor's License number. See CFC 510.5.3 for qualifications.

d) Name and type of supervising station service monitoring system as per NFPA 1221 section 9.6.13.

e) Occupancy group(s) of building or area as defined by the California Building Code.

f) Number of basements, number of stories above basement, building height, total building area, and building construction type.

g) Scope of work. If the scope of work is the demolition of an existing ERCC system, justification for removal shall be provided.

h) Description of transmission zone assignments such as complex name, address, or campus and designation.

i) A note stating that the design and installation complies with the CFC (2022 edition), NFPA 72 (2022 edition) & 1221 (2019 editions), the California Electrical Code (2022 edition), the California Building Code (2022 edition), and the 2023 Milpitas Fire Department ordinances, policies, and standards.

j) A clear site map and/or vicinity map.

k) All other pertinent notes.

2. A key plan of the building and/or complex indicating the street location and the ERRC System Controls within the building shall be provided.

3. State the required performance objective of the ERCC System per CFC 510.4 and NFPA 1221, section 9.6. Should the codes conflict, the most stringent shall prevail.

C. Equipment List

1. Provide the model number, manufacturer's name, description, quantity, and symbols to be used (legend) for each device, equipment, and conductors proposed to be installed.

2. The symbols used on the plans shall match the legend. Strike out any "typical" symbols that do not apply.

D. Floor Plan – the following shall be clearly identified:

1. Scale used and a graphical representation of the scale. The minimum scale for ERRC plans is 1/8" =1'-0". Metric scale shall not be accepted.
2. Room and room names.
3. The locations of partitions, non-rated walls, and rated walls.
4. The location of all Emergency Responder equipment.
5. Power and Panel locations.
6. Raceway outing.
7. Conduit and conductor size.
8. Roof plan showing location(s) of antennae.
9. Location(s) of In-Building Antennas.
10. Band width.

E. Riser Diagram – provide the following:

1. Single-line wiring diagram (riser diagram) that shows the interconnection of equipment of the whole system.
2. Location and fire protection rating of pathways.
3. Details and location of penetrations on fire rated horizontal and vertical assemblies.
4. Type and size of wire or conductor to be used.
5. Schematic drawing of electrical system and backup power.

F. Detail Diagram – Show supervisory points from repeater and the operational matrix.

G. System Monitoring. The emergency responder communication coverage system shall be monitored below.

1. By a listed fire alarm control unit installed with the protected building. Automatic supervisory signals to the fire alarm shall include the following:

1.1. Loss of normal AC power.
1.2. System battery charger(s) failure
1.3. Low battery capacity at 70-percent reduction of operating capacity.
1.4. Donor antenna malfunction.
1.5. Active RF emitting device malfunction.
1.6. Failure of critical system component.
1.7. The communication link between the fire alarm system and the in-building, two-way emergency responder communication coverage system.
1.8. Oscillation of active RF-emitting device(s).

2. By a dedicated monitoring panel within the fire command center to annunciate the status of all RF emitting devices and system component location. The monitoring panel shall provide visual and labeled indications of the following for each system component and RF emitting device.
2.1. Loss of normal AC power.
2.2. System battery charger(s) failure
2.3. Low battery capacity (ton 70% depletion)
2.4. Donor antenna malfunction
2.5. Active RF emitting device malfunction
2.6. System component malfunction
2.7. The communication link between the dedicated monitoring panel and the in-building, two-way emergency responder communication coverage system.

3. System performances shall be continuously monitored by an approved third-party monitoring company capable of monitoring the performance of the ERCC system and initiating appropriate response if the system begins to operate outside the established system parameters.

H. Calculations - The System Design-Calculations shall identify:

1. Downlink Signal Levels on all floors. (The Benchmark Test Data should include this information.)
2. Outdoor Signal Levels and Clutter Loss (CLlow) to the Donor Site. (The Benchmark Test Data should include these levels on all exterior and immediately inside of the same exterior side of the building in question.)
3. Bldgloss– Ground Floor (The Benchmark Test Data should include these levels.)
4. RSL at the Roof-top Antenna location and Clutter Loss (CLhigh) to the Donor Site. (The Uplink Path Calculations should include these levels based on the selected donor antenna location.) Design will also include the calculated noise level received at the donor macro site receiver antennae: not to exceed -150dBm in band noise.
5. Antenna Density identifying the Max. and Min. Uplink Input levels from the DAS
6. Downlink and Uplink Gain Settings for the amplifier (These levels subject to adjusted at time of system optimization)

7. Uplink Path Calculations for Max. and Min. signal levels, including predicted in-band noise received at the donor macro site receivers.
8. Coverage Estimate showing downlink coverage and signal levels.
9. Engineered/calculated in band noise level received by the macro site receive antenna show noise levels do not exceed -150dBm
10. Link budget report or dB loss calculation on the feeder circuit.
11. Secondary power calculation – See note below.
    i. **Note:** Secondary power supply – Emergency responder communication coverage systems shall be provided with an approved secondary source of power per 2016 NFPA 1221 section 9.6.12 in addition to CFC 510.4.2.3 and 1203.2.3.

I. Signal Propagation Map – Provide a map indicating the signal strengths as designed and then as installed by As-Built record. These maps are commonly printed in color; however, they are scanned in black and white. The map(s) must be graphically distinguishable, when scanned to black and white copy.

J. Attachments

1. Manufacturer's specification sheets for all devices, equipment, and materials to be used shall be submitted, including the cables, amplifiers, UPS, batteries, antenna and 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.

VI. Technical Requirements

Systems, components, and equipment required to provide emergency responder communication coverage systems shall comply with Section 510.4.1 through 510.4.2.8.

A. Communication signal strength. The building shall be considered to have acceptable emergency responder communication coverage where signal strength measurements in 90 percent of all areas on each floor of the building meet the **Minimum signal strength into the building** and **Average signal strength out of the building** requirements specified in items 1 and 2 below.

Exception: Critical areas, such as the fire command center(s), the fire pump room(s), interior exit stairways, exit passageways, elevator lobbies, standpipe outlet locations, rescue air filling stations, cache room areas, sprinkler sectional valve locations, and other areas required by the fire code official, shall be provided with 99 percent floor area communication coverage.

1. **Minimum signal strength into the building.** A minimum inbound signal shall be sufficient to provide usable voice communications throughout the coverage area as specified by the fire code official. The inbound signal level shall be minimum of -

95dBm throughout the coverage area and sufficient enough to provide not less than a Delivered Audio Quality (DAQ) of 3.4 for digital macro systems and a DAQ of 3.0 for analog macro systems or an equivalent Signal-to-interference-Plus-Noise-Ratio (SINR) applicable to the technology for either analog and digital signals and shall be receivable in 90% of the area of each floor within the building when transmitted from the SVRIA P25 Phase 2 700 MHz Digital Trunked Radio System.

2. **Average signal strength out of the building (digital).** A maximum signal strength of -95 dBm shall be received by the SVRIA P25_Phase 2 700 MHz Digital Trunked Radio System at the designated donor site receiver antenna when transmitted from 90% of the area of each floor within the building.

3. **Average signal strength out of the building (analog).** The average signal strength to provide a DAQ of 3.0 for analog channels required to be included into the BDA/DAS system.

B. Signal strength differential. The system shall be designed such that the BDA/DAS signal strength, immediately inside building exterior walls, is at least 15 dB less than the exterior (macro system) signal strength. The signal strength differential shall apply whether the building has an open area or subdivided floor plan.

C. Delivered audio quality. The communication coverage system shall provide a minimum delivered audio quality of level 3.4 (DAQ “3.4”) on each floor of the building or structure. DAQ 3.4 constitutes audio quality that makes speech understandable with repetition only rarely required with some noise and distortion (TSB88).

D. Noise Floor. BDA systems shall not exceed -150 dBm of in-band noise to macro receiver antenna systems. Measurements will be validated against FCC 47 CFR 90.219.

E. Building conduit and pathway survivability. All new buildings requiring emergency responder communication coverage shall be constructed with ERCCS backbone cable raceways and enclosures, which extend from the head-end equipment location to the lowest level/floor or subterranean floors and to the roof. Cable pathways shall be included in the architectural design of the building and shown on building permit construction documents.

1. Riser cable raceways shall be not less than a two-inch (2”) conduit. Riser cables shall be routed through a 2-hour-rated enclosure.

   Exception:

   1. In sprinklered buildings, not containing 2-hour-rated vertical enclosures, the riser cable may be routed through a 1-hour fire-rated enclosure.

2. In existing buildings, riser cable mechanically protected by metal conduit can be routed through a sprinkler protected, 1-hour rated enclosure, including the door.

2. All feeder cable shall be designed with a pathway survivability of Level 1, Level 2, or Level 3 per 2022 NFPA 72 12.4.

   Exception: Where leaky feeder cable is utilized as the antenna, it shall not be required to be installed in metal raceway.

3. All communication cable (riser and feeder) is required to be plenum-rated. No cable other than communication cable is allowed to comingle with the communication cable in the conduit provided it is listed, shielded cable that will not interfere with the communication cable.

4. Ready access shall be provided to riser conduit and feeder cables for installation, service and inspection.

5. Provide access by way of removable ceiling tiles or minimum 20”X30” access panels along hallways and partitions/walls. Fire rated access panels shall be used where access is through the fire rated assemblies.

6. All floors of the subterranean parking garages shall meet access, conduit installation and rating requirements.

F. System design. The emergency responder communication coverage system shall be designed in accordance with CFC Section 510.4.2.1 through 510.4.2.8.

1. **Amplification systems allowed.** Buildings and structures that cannot support the required level of communication coverage from the macro sites shall be equipped with a radiating cable system, and/or a distributed antenna system with Federal Communications Commission (FCC)-certified, Class A public safety grade signal boosters (amplifiers) or repeaters designed for the frequencies specified by the fire code official, in order to achieve the minimum required communication coverage.

2. **Technical criteria.** The fire code official shall provide the various frequencies required, the location of communication sites, effective radiated power of communication sites, and other supporting technical information upon request by the building owner or owner’s representative.

   a. The Public Safety communication system, extending from the head-end amplifier to the distributed antennas shall not be combined with other DAS equipment installed in the building.

b. A single antenna system is allowed, provided the antennas are capable of passively distributing all frequencies between 698MHz and 2.7GHz and the hardware for both Public Safety and wireless carrier frequencies are completely separate with necessary filters. The single antenna system must also be tested and certified by a qualified contractor.

c. Where fiber distribution systems are used to extend the Public Safety communication system throughout the building the horizontal fiber runs shall be enclosed in conduit. Underground cables installed between buildings shall be installed in accordance with Section 5.3 of 2016 NFPA 1221.

3. **Power supply sources.** Emergency responder communication coverage systems shall be provided with at least two independent and reliable power supply sources conforming to NFPA 72 and the Electrical Code, one primary and one secondary. The standby power supply shall be an approved Uninterruptible Power Supply (UPS) capable of operating the emergency responder communication coverage system for a duration of not less than 24 hours. When primary power is lost, the power supply to the emergency responder communication coverage system shall automatically transfer to the standby power supply.

   Emergency power off (EPO). The UPS system shall be equipped with an emergency power off (EPO) switch in a location approved by the fire code official. The EPO shall disconnect both the circuit breaker and secondary power supply simultaneously.

4. **Signal booster requirements.** If used, signal boosters shall meet the following requirements:

   a. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type waterproof cabinet.

   b. Battery systems used for the emergency power source shall be contained in a NEMA 4-type waterproof cabinet.

   c. The signal booster system and power supply(ies) shall be electrically supervised and monitored in accordance with 2022 CFC Section 510.4.2.4 and 2019 NFPA 1221. For buildings without a fire alarm system, a dedicated monitoring panel in accordance with NFPA 72 shall be provided to annunciate automatic supervisory and trouble signals for the signal booster system and power supply(ies) and sound an audible signal at a constantly attended location.

   d. Equipment shall have FCC certification prior to installation.

5. **Additional frequencies and change of frequencies.** The emergency responder communication coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.

VII. BDA/DAS Design, Optimization, and Acceptance Process.

The following sections outline relevant information about optimizing BDA/DAS systems that will operate in conjunction with the Silicon Valley Regional Communications System (SVRCS) Project 25 Land Mobile Radio (LMR) system frequencies and ensure an optimal BDA/DAS design and alignment to avoid negative impact to the P25 LMR system.

A. System Technical Information. To ensure BDA/DAS system optimal design to operate efficiently with the SVRCS P25 system, contact the County Communications Engineering (contact information listed below) for detailed SVRCS antennae systems design. BDA/DAS technical guidelines that are pertinent to BDA/DAS preliminary design requirements can be found on the SVRIA website www.svria.org and/or by contacting Santa Clara County Communications Radio Shop at (408) 977-3222 Monday through Friday, 8am to 5pm, and/or email at radioshop@911.sccgov.org.

1. After final installation of the BDA/DAS system, vendors must contact the Santa Clara County Communications Radio Shop to schedule BDA/DAS optimization/alignment and testing with the SVRCS. **NOTE:** The ERRCS system cannot be placed into operation without authorization from County Communications.

2. Once the BDA/DAS optimization is scheduled, test radios are available for sign out at the Santa Clara County Radio Shop that will be used to validate the BDA/DAS operation meets required macro system power levels and DAQ 3.4 or better using the SVRCS.

3. Upon completion of BDA/DAS optimization and testing, a pass-through document will be generated by the Santa County Communications Radio Shop. This document will be forwarded to the fire code official and the BDA/DAS Vendor.

B. The fire code official will not approve BDA/DAS operation for building occupancy unless this pass-through document is completed and received by the fire code official, Milpitas Fire Department.

C. For requisite analog channels in the BDA/DAS, testing must be coordinated with the

primary dispatch center for those channels.

VIII. Installation Requirements

The installation of the public safety communication coverage system shall be in accordance with CFC Section 510.5.1 through 510.5.4.

A. Approval prior to installation. Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC shall not be installed without prior coordination and approval of the fire code official.

B. Minimum qualifications of personnel. The minimum qualifications of the system designer, lead installation personnel and personnel conducting communication system testing shall include possession of both of the following:

1. A valid FCC-issued general radio operators license; and
2. Certification of in-building system training issued by one of the following:
   a. The manufacturer of the equipment being installed,
   b. or other relevant industry recognized institutions.

All design documents and all tests shall be documented and signed by a person meeting the minimum qualification noted in this section.

IX. Acceptance test procedure and system certification. Coordination with the Milpitas Fire Department and the Santa Clara County Communications Radio Shop is required before a new BDA/DAS system is turned on for the first time.

A. Upon completion of installation, the building owner shall have the communication system tested to verify that two-way coverage on each floor of the building is in accordance with CFC Section 510.4.1. The test procedure shall be conducted as follows:

1. It is the responsibility of the DAS/BDA Designer / Contractor of Record to coordinate & preschedule in advance with the Fire Department approved 3rd Party Testing Contractor to perform the partial and / or complete Functional Integrity Testing**.**

2. See VII for system optimization/alignment requirements. To the extent possible, system optimization/alignment shall be conducted concurrently with system testing below.

3. Talk-back testing from a site to the SVRIA P25 Phase 2 700 MHz Digital Trunked Radio System shall use the Milpitas Fire and/or Police Department Public Safety radio(s), or loaner radios available from County Communications, on the designated test channel(s) and may be witnessed by a representative of the Milpitas Fire and/or Police Department. Talk-back testing will be conducted with portable radio, with half wave antenna, worn on hip using a remote speaker mic.

4. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.

5. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's communications system.

6. In the event that three of the test areas on a floor fail the talk-back test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. If the system fails the 90% coverage requirement for the 40-area test, the emergency responder communication system shall be altered to meet the 90-percent coverage requirement.

   Exception: Critical areas as defined by the fire code official shall be provided with 99 percent floor area coverage.

7. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the SVRIA P25 Phase 2 700 MHz Digital Trunked Radio System. Once the test location has been selected that location shall represent the entire test area. Failure in the selected test location shall be considered failure of that test area.

8. The test for emergency responder communication coverage will be considered passed when 90% of the test locations on each floor are able to pass two-way communications to and from the outside of the building.

   Exception: Critical areas as defined by the fire code official shall be provided with 99 percent floor area communication coverage.

9. The gain values/output levels of all amplifiers shall be measured, and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.

10. As part of the installation or existing building benchmark testing a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster and noise floor requirements meets 47 CFR 90.219. This test shall be conducted at time of installation and subsequent annual inspections.

11. Systems shall be tested using portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ level as specified in Sections 510.4.1.1 and 510.4.1.2.

12. The system shall also meet the requirement of Section VI-A.2 and VI-B.

13. Individuals conducting initial benchmark and system acceptance tests shall meet the minimum qualifications in accordance with CFC Section 510.5.2. All test results are required to be validated by a Fire Department approved third party testing contractor, independent of the system designer and installer.

Prior to issuance of the building Certificate of Occupancy, a system acceptance test report and the optimization/alignment pass through document shall be submitted to the fire code official, maintained on the premises and be made available to the Fire Department upon request. The report shall verify compliance with CFC Section 510.5.3 and include the emergency responder communication coverage system equipment data sheets, diagram showing device locations and wiring schematic, and a copy of the electrical permit and system certification letter.

B. Compliance. The emergency responder communication coverage system installation and components shall also comply with all applicable federal regulations, including, but not limited to, FCC 47 CFR Part 90.219.

C. Location of equipment. For buildings with a fire command center, the communications control equipment shall be located within the command center in a location approved by the Fire Code Official.

For buildings without a fire command center the communications control equipment shall be located inside the building near the fire alarm control panel, or other approved location. The approved location shall be separated from the rest of the building by a 2-hour rated fire barrier.

Exception:

1. In sprinklered buildings, not containing 2-hour-rated vertical enclosures, the riser cable may be routed through a 1-hour fire-rated enclosure. The approved location shall be separated from the rest of the building by a 1-hour rated fire barrier.
2. In existing buildings, riser cable mechanically protected by metal conduit can be routed through a sprinkler protected, 1-hour rated enclosure, including the door. The approved location shall be separated from the rest of the building by a 1-hour rated fire barrier.

D. Signage. Buildings equipped with an emergency responder communication coverage system shall be identified by an approved sign located above or near the building key box stating: “Communication System Installed”.

X. Maintenance

The emergency responder communication coverage system shall be maintained operational at all times in accordance with CFC Sections 510.6.1 through 510.6.4.

A. Testing and proof of compliance. The emergency responder communication coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Individuals conducting the tests shall meet the minimum qualifications in accordance with CFC Section 510.5.2. All test results are required to be validated by an approved third party, independent of the system designer and installer._Testing shall consist of the following:

1. In-building coverage test as described in CFC Section 510.5.4.

2. Signal boosters shall be tested to verify that the gain/output level and audio performance is the same as it was upon initial installation and acceptance. The signal booster will be verified that intermodulation products and noise floor measurements are still in compliance with 47 CFR 90.219 and these measurements are recorded and kept on record by the BDA system owner.

3. The low battery capacity (to 70% depletion) shall be demonstrated at time of fire inspection with a test method or procedures acceptable to the Fire Department.

4. All other active components shall be checked to verify operation within the manufacturer’s specifications.

5. At the conclusion of the testing, a report, which shall verify compliance with CFC Sections 510.5.4 and 510.6.1 shall be submitted to the fire code official and a copy

maintained on the premises and made available to the Fire Department upon request.

B. Additional frequencies. The building owner shall modify or expand the emergency responder communication coverage system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety communication coverage system on previous frequencies does not exempt this section.

Any adjustment to power levels, gain settings, or make modifications like adding DAS or inside antennas, you will have to secure prior approval from SCCC and the Fire Marshal's Office of the Milpitas Fire Department.

C. Field testing. Agency_personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of communication coverage. For contractors or maintenance personnel conducting the annual test, the following shall be followed:

1. Contact Santa Clara County Communications (SCCC) for test radios.

2. After your annual testing is complete, please transmit your annual test reports to both SCCC & the Fire Marshal's Office.

D. Qualifications of testing personnel. All tests shall be documented and signed by a person meeting the minimum qualifications set forth in CFC Section 510.5.2.

E. Continuing operation/supervision. The occurrence of any fault in an emergency responder communication coverage system where the system function is decreased shall result in the transmission of a supervisory signal to a supervisory service. Systems that are out-of-service for more than 8 hours require notification to the fire code official.

Design Details for Approved Building Signage Required in Section IX-D of this Standard:

6” x 8” Sign
½” Lettering
2” x 4” Graphic
Red Background with White Letters and Graphic

Emergency Responder Communication Coverage System Installed