Santa Monica Fire Department

Policy 1-12

Requirements for Emergency Responder Enhanced Radio Coverage System

A. Building Requirements for an Emergency Responder Enhanced Radio Coverage System

1. All new buildings shall have approved radio coverage for emergency responders within the building 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.

   Exceptions:

   1. Where approved by the building official and the fire code official, a wired communication system in accordance with CFC 907.2.13.2 shall be permitted to be installed or maintained in lieu of an approved radio coverage system.

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

   3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder radio coverage system.

2. Existing Building: Existing buildings that do not have approved radio coverage for emergency responders within the building, based upon existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building, shall be equipped with such coverage according to one of the following:

   1. Where an existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with Section 510.1, Exception 1.

   2. Within a time frame established by the Santa Monica Fire Department—Office of the Fire Marshal.

   Exception: Where it is determined by the Santa Monica Fire Department—Office of the Fire Marshal that the radio coverage system is not needed.

B. Permit Required: In addition to a building permit, a separate construction permit issued by the Santa Monica Fire Department for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in CFC 105.7.5. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

C. Emergency Responder Enhanced Radio System Drawings

1. The drawings must include the following:
   a. This project is required to meet the requirements in CFC Section 510 for emergency Radio Coverage.
   b. If two-way communication is not provided for a building due to providing an emergency responder radio coverage system, provide notes on plans stating emergency radio coverage is provided in lieu of two-way communication, when a wired fire communication systems is required per CFC 907.2.13 .

c. If the building does not meet the required -95 dB in and out of the building throughout over 90% of the building, then provide drawings to indicate all the areas on all of the floors that will require a radiating cable system, distributed antenna system with a FCC certified amplifier or any other proposed system to be approved by the Santa Monica Fire Department.
d. Name of the system manufacturer and installer.

D. Electrical Plans
1. The electrical plans must include the following:
   a. A secondary source of power for the emergency responder enhanced radio coverage system per CFC 604.
   b. The secondary source of power must be able to provide backup power for at least 24 hours.
   c. The secondary source of power must automatically revert when there is a power failure to the primary power source.

E. Design Radio Coverage System
1. Buildings that cannot support the require levels of signal strength are required to have one of the following:
   a. A radiating cable system
   b. A distributed antenna system with a FCC certified amplifier
   c. Any other system approved by the Santa Monica Fire Department
2. A building is considered to have an acceptable signal strength and not require an emergency responder enhanced radio system when there is a 90% coverage rate on all floors throughout the entire building.
   a. A minimum signal strength of -95dB is required for both transmit and receive from within the building.
3. The frequencies the for the emergency responder radio system are in the UHF 450-490MHZ range. See chart for below for the systems 9 frequencies. The system is a trunked digital radio system.

Downlink Frequency	Uplink Frequency
471.0625	474.0625
482.3250	485.3250
471.0875	474.0875
482.5250	485.5250
470.1250	473.1250
453.8500	458.8500
482.0125	485.0125
453.7500	458.7500

4. The City of Santa Monica Public Safety Radio System has two donor sites that can utilized for distributed antenna system.
    a. 100 Wilshire Blvd, Santa Monica, CA, 90401
    b. 953 Franklin Street, Santa Monica, CA, 90403
5. The emergency responder enhancement radio system shall include automatic supervisory and trouble signals for malfunctions of the signal booster and power supplies that are annunciated by the fire alarm system that comply with all subsections of 24.5.2.6 of the 2013 NFPA 72.
6. The emergency responder enhanced radio system shall not be operational on any of the frequencies listed above without prior coordination and approval of the Santa Monica Fire Department.
7. The emergency responder radio 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.

F. Installation

1. The system installer and their lead installation personnel must have the following minimum qualifications.
    a. A valid FCC general radio operator license.
    b. Certification of in-building radio system training issued by a nationally recognized organization.
2. After completion of the installation, the system is required to be tested after construction is completed to ensure the system has a minimum of 90% two-way radio coverage throughout each floor of the building.
    a. Each floor of the building must be divided into 20 approximately equal test grids.
    b. The test shall be conducted using a calibrated spectrum analyzer. Installers will not be granted permissions to utilize a mobile or portable radio on any of the City's licensed frequencies for purposes of coverage testing.
    c. Failure of a maximum of two nonadjacent test grids per floor passes the coverage test.
    d. In the event that there are three test grid failures on a given floor, the test may be divided into 40 equal test grids. In the 40 grids test, a maximum of 4 nonadjacent test grids, passes the test for each floor.
    e. In the event that more than 4 test grids fail during the 40 grid test, the system must be modified to ensure a 90% coverage compliance.
    f. The gain values of the amplifier should be kept on file with the building owner for reference for annual device maintenance and testing.
    g. As part of the testing, a spectrum analyzer or other suitable test equipment shall be used to ensure there are no spurious oscillation being generated by the signal booster.
    h. The system installed must be registered with the FCC and proof of registration must be provided to the City.

3. Prior to issuance of a certificate of occupancy, a final acceptance report shall be submitted to the Santa Monica Fire Department containing a floor plan with the signal strengths at each location tested and any other relevant information signed by a FCC certified technician.

G. Testing of the system shall be annual or whenever structural modifications are made per section 510.6.1 of the California Fire Code.

H. The building owner is responsible for modifying or expanding the emergency responder enhanced radio coverage system at their expenses if the FCC requires changes or if additional frequencies are licensed to the City of Santa Monica by the FCC.