



Emergency Responder Radio Coverage

FIRE-5-1

THE CITY OF SAN DIEGO

CITY OF SAN DIEGO DEVELOPMENT SERVICES
1222 FIRST AVENUE, MS-401 SAN DIEGO, CA 92101-4101

FEBRUARY 2015

The purpose of this Technical Bulletin is to provide the guidelines and requirements to the building permit applicant for compliance with the requirements in Section 510 of the 2013 California Fire Code (CFC), Section 510 and Section 915 of the California Building Code (CBC) for emergency responder radio coverage.

I. WHERE REQUIRED?

A. New Buildings

All new buildings and structures designed under the 2013 California Building Code (CBC) are required to comply with this Technical Bulletin except for the following:

1. Group R-3 occupancies (single family homes, duplexes, and townhomes) as defined by the CBC.
2. Open parking garages with no subterranean portions.
3. Buildings or structures that are three (3) stories or less in height and that do not have subterranean storage or parking.
4. Buildings or structures that are primarily constructed of wood and do not have subterranean storage or parking.

B. Existing Buildings

Existing buildings for which a building permit was issued prior to January 1, 2015 are required to comply with the requirements of this technical bulletin if the two-way wired fire department communication system is removed.

II. SUBMITTING FOR BUILDING PERMIT

A. Architectural Drawings

The following notes must be added to the architectural drawings for buildings requiring to meet the requirements for emergency responder radio coverage as listed above:

1. This project is required to meet the requirements in CFC Section 510 for Emergency Responder Radio Coverage.
2. If this building does not meet the signal strength requirement of -95 dB into and out of the building in 95% of the all areas on each floor of the building, a radiating cable system, a distributed antenna system with FCC certified signal boosters, or other system approved by the San Diego Fire Department will be provided to achieve the required coverage.
3. Name of the system designer and the lead installation personnel.

B. Fire Alarm Plans

If two-way communication is not provided for a building due to providing an emergency responder

Documents Referenced in this Technical Bulletin

- 2013 California Building Code, (CBC)
- 2013 California Electrical Code, (CEC)
- 2013 California Fire Code, (CFC)

er radio coverage system, provide notes on fire alarm plans stating that emergency radio coverage is provided in lieu of two-way communication.

C. Electrical Plans

The electrical plans must include an approved secondary source of power for the emergency responder radio coverage system. The secondary power supply must be capable of operating the emergency responder radio coverage system for at least 24 hours. When the primary power is lost, the power supply to the system must automatically transfer to the secondary power supply.

III. DESIGN RADIO COVERAGE SYSTEM

A. Amplification Systems Allowed

Buildings that cannot support the required level of radio coverage must be equipped with one of the following:

1. A radiating cable system,
2. An internal multiple antenna system with Federal Communications Commission (FCC)-certified bi-directional amplifiers, as needed, or
3. Systems otherwise approved by the City radio system Communications Engineer in order to achieve the required radio coverage.

B. Radio Signal Strength

The building is considered to have acceptable emergency responder radio coverage when the signal strength measurements in 95 % of all areas on each floor of the building meet the following signal strength requirements.

1. A minimum signal strength of -95 dBm must be receivable within the building.
2. A minimum signal strength of -95 dBm must be received by the Agency's radio system when transmitted from within the building.

C. Frequency Range

The frequency range which must be supported shall be as follows:

1. 800MHZ uplink band 806MHZ – 824MHZ
2. 800MHZ downlink band 851MHZ – 869MHZ
3. 700MHZ uplink band 799MHZ – 805MHZ
4. 700MHZ downlink band 769MHZ – 775MHZ

D. Power Supply

An approved secondary source of power must be provided for radio coverage systems requiring electrical components. The secondary power supply shall be capable of operating the radio coverage system for at least 24 hours. The secondary power supply shall be either a battery system or an emergency generator. These systems must be included on the electrical permit plans.

E. Approval Prior to Installation

No amplification system capable of operating on frequencies used by the Regional 700 and 800 MHz Radio Systems may be installed without prior coordination and approval of the radio system licensee, City of San Diego Information Technology/Wireless Services Division. Any such system shall comply with any standards adopted by this agency.

IV. INSTALLATION

A. Qualifications of Personnel

The system designer and the lead installation personnel must have the following minimum qualifications.

1. A valid FCC-issued general radio operator license, and
2. Certification of in-building system training issued by a nationally recognized organization, school such as Associated Public Safety Communications Officials International (APCO), National Association of Business and Education Radio (NABER), Personal Communications Industry Association (PCIA) or the International Association for Radio, Telecommunications and Electromagnetics, Inc. (iNARTE) or a certificate issued by the manufacturer of the equipment being installed.

B. Acceptance Test

Upon completion of the installation, the system is required to be tested after construction is complete in order to ensure that the two-way coverage on each floor of the building is a minimum of 90 %. The test procedure shall be as follows:

1. Each floor of the building must be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency of jurisdiction talking through the agency's radio communications system in both receive and transmit modes.
3. Failure of a maximum of two nonadjacent test areas shall not result in failure of the test.
4. In the event that three of the test areas fail the test, the floor shall be permitted to be divided into 40 equal test areas. Failure of a maximum of four nonadjacent test areas shall not result in failure of the test. If the system

fails the 40-area test, the system must be altered to meet the 90% coverage requirement.

5. A test location approximately in the center of each test area must be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location is considered a failure of that test area. Additional test locations are not permitted.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept of file with the building owner so that the measurements can be verified during annual tests.
7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation.
8. System installed must be registered with the FCC. Proof of registration must be provided to the City.

C. Final Report

Prior to issuance of a certificate of occupancy, a final acceptance report shall be submitted to the Structural Inspector containing a floor plan and the signal strengths at each location tested and other relevant information stamped and signed by the FCC-certified technician or Engineer with a statement specifying that the building complies with all of the requirements of CFC 510.

V. MAINTENANCE

A. Testing

Testing is required both annually and whenever structural modifications are made that will impact the system. See CFC Section 510.6.1 for requirements for testing.

B. Additional Frequencies

The building owner is responsible for modifying or expanding the emergency responder radio coverage system at their expense if the FCC requires changes or if additional frequencies are made available by the FCC.