



CITY OF RIVERSIDE FIRE DEPARTMENT

FIRE PREVENTION DIVISION

INFORMATIONAL BULLETIN: 2022-014

APPROVED BY: C. Kodat, Fire Marshal, 1/1/2023

PUBLIC-SAFETY RADIO AMPLIFICATION SYSTEM

Riverside Municipal Code Chapter 16.36 and 2022 California Fire, Code Section 510, and National Fire Protection Association (NFPA) 1221 2019 Edition

The purpose of this section is to require minimum standards to ensure a reasonable degree of reliability for radio communications of the City's Public Safety Emergency Services from within certain buildings and structures within the City of Riverside. System shall comply with all the requirements of the Riverside Municipal Code, Chapter 16.36 and the 2022 California Fire Code, Section 510 and NFPA 1221 2019 Edition

Section 16.36.030 Scope.

The provisions of this Section shall apply to:

- New buildings in accordance with California Fire Code Section 510 Emergency Responder Communications Coverage, and NFPA 1221, 2019 Edition.
- Existing buildings when modifications or repairs exceed 50 percent of the usable floor area; and
- All basements regardless of the occupancy type, or parking structures.

Section 16.36.040 Radio Coverage.

For the purpose of this section, adequate radio coverage shall constitute a successful communications test between the equipment in the building and the communications center where signal strength measurements in 95 percent of all areas and 99 percent of areas designated as critical areas by the fire code official on each floor of the building meet the signal strength and shall include all of the following:

Definitions:

- Agency – Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not limited to various public safety agencies such as fire department, emergency medical services and law enforcement.
- City Certified Persons – A person skilled and factory trained on in-building RF distribution system and approved by the City of Riverside. Typically, these will be person possessing a current FCC or a current

technician certification issued by the Associated Public-Safety Communications Officials International (APCO).

- Radio Frequency (RF) Distribution System – Any system designed to receive radio signals outside of the building and radiate it throughout the Building and conversely, receive a radio signal generated within the Building and re-radiate a signal outside of the Building.
- Downlink – Radio frequencies traveling FROM outside the structure to inside the structure. Typically, the signals transmitted from a distant repeater to a portable radio inside a building.
- Radiating Cable System – A system that feeds a series of amplifiers and radiation cable antennas spread through the using special radiating (leaky) coaxial cable.
- Signal Booster – A specialized radio frequency amplifier, also known as a “Building Directional Amplifier” or “BDA.” That receives specific radio frequency signals from an antenna and amplifies and retransmits these signals.
- Uplink – Radio frequencies traveling from inside the structure to the outside the structure.
- Voter-Receiver System – Receivers installed at multiple tower sites which feed audio to a comparator or voter at a central site. The comparator selects the receiver with the best signal and sends that audio to the dispatcher.

Required radio frequencies:

- The Radio Amplification system shall include and pass any signal on the uplink and the downlink, for current frequencies please contact Riverside Police Department Communications Analyst, Steve Powell (951) 353-7270. (Police and Fire frequencies)
- Plan submittal:
 - Submit at least three copies of the system design shall be submitted to the Fire Department for review and approval, a fee will be required at the time of submittal. The design shall comply with this document, 2022 California Fire Code, Section 510 and the 2019 NFPA 1221.
 - Show the location of the amplification equipment and associated antenna systems, required fire rated enclosures/shafts, including a view showing building access to the equipment; and schematic drawings of the electrical, backup power, and antenna system shall be submitted to the City of Riverside Fire Prevention at (951) 826-5737. (RMC, Sec. 16.36.060)
- Standby power:

Shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with California Fire Code, Section 1203. The standby power supply shall be capable of operating at 100% system capacity for a duration of not less than 12 hours. CFC, Section 510.4.2.3
- System Monitoring:

Shall be monitored by a listed fire alarm control unit. Automatic supervisory signals shall include the seven requirements listed in the CFC, Section 510.4.2.5
- Minimum qualifications of personnel:

The minimum qualifications of the system designer and lead installation personnel shall include:

- A valid FCC-issued General Radio Operators License, **and**
- Certification of in-building system training issued by a nationally recognized organization or school, or a certificate issued by the manufacturer of the equipment being installed. (CFC Section 510.5.3)

- Initial acceptance testing:
 - Testing procedures shall comply with the RMC, Section 16.36.070.
 - Once system has been installed and tested by the installing company, contact the Police Communications Systems Analyst, Steve Powell at (951) 353-7270 so that the system can be evaluated in both frequency ranges. (RMC, Sec. 16.36.070)
 - The final certification(s) shall be provided to the City frequency coordinator and the Fire Department. All compliance testing shall be the responsibility of the building or structure owner and shall be done at no expense to the City. (RMC, Sec. 16.36.075)

- Maintenance:
 - The public radio coverage system shall be maintained, and operational at all times. (CFC, Sec. 510.6)
 - A permit is required prior to any modifications or alterations of the emergency responder radio coverage system. (CFC, Sec. 510.3)
 - The emergency responder radio 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. See the CFC, Sec. 510.6.1 (1-5) for testing requirements.
 - The building owner shall modify or expand the emergency responder radio coverage system at his or her 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 radio coverage system on previous frequencies does not exempt this section. (CFC, Sec. 510.6.2)
 - 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 radio coverage. (CFC, Sec. 510.6.4)

- Annual testing:
 - When an in-building system is installed, all active components must be tested a minimum of once every twelve (12) months. If communications appear to have degraded or if the tests fail to demonstrate adequate system performance, the owner of the building or structure is required to remedy the problem and restore the system in a manner consistent with the original approval criteria. The re-testing will be done at no expense to the city as required in the original testing procedures. Annual tests results shall be sent to the City's frequency coordinator. (RMC, Sec. 16.36.080)
 - City staff may, at any time during routine business hours, conduct independent testing of the in-building system to verify proper operation. (RMC, Sec. 16.36.080)