



MEMORANDUM - MONROVIA FIRE AND RESCUE

09/29/2021

EMERGENCY RESPONDER RADIO COVERAGE REQUIREMENTS

All new buildings shall have approved radio coverage for emergency responders pursuant to California Fire Code (CFC) Section 510. The intent of this guideline is to provide interpretation of the minimum standards necessary to meet the requirements for an Emergency Responder Radio Coverage (ERRC) system in accordance with the code.

The radio coverage system and all of its components shall be installed and maintained in accordance with the California Fire Code (CFC) Section 510, and with the applicable provisions of NFPA 72 and NFPA 1221.

I. OBSTRUCTION BY NEW BUILDING:

When, in the opinion of the fire code official, the construction of a new building obstructs the line of sight emergency radio communications to existing buildings or other locations, the developer of the new building shall correct the degraded radio coverage as necessary for the existing systems to be operational at all times in accordance with CFC Section 510.

II. EMERGENCY RESPONDER RADIO COVERAGE IN EXISTING BUILDINGS:

Existing buildings shall provide approved radio coverage for emergency responders as required in Chapter 11 of the CFC and Monrovia Municipal Code.

III. PERMIT REQUIRED:

A construction permit is required for installation of or modification to an ERRC system and related equipment as specified in CFC Section 510.3. Maintenance performed in accordance with fire code is not considered to be a modification and does not require a construction permit.

IV. INSPECTION:

All Emergency Responder Radio Coverage Systems “ERRCS” (BDA & DAS), as defined in Section 510 CFC, shall be inspected by a third-party inspector approved by the City. To be approved by the City, a third-party inspector must have a minimum of 20 years of experience in the engineering, operation, and maintenance, of bidirectional amplifier systems, and a minimum of 10 years of public-sector experience (non-contract) in the engineering, operation, and maintenance, of Project25 public safety radio communications infrastructure.

Inspection of the systems, validation of functional operability, and verification of compliance shall be conducted by the fire official or his/her designee *prior* to issuance of a Certificate of Occupancy or Temporary Certificate of Occupancy.

V. SYSTEM DESIGN AND TECHNICAL REQUIREMENTS:

The design, specifications, installation, components, and equipment required to provide an ERRC system shall comply with CFC Section 510.4.1 through 510.4.2.5.

Bidirectional amplifiers (BDA’s) currently approved for use in the City of Monrovia are manufactured by the following: ADRF (with external filtering from Telewave or Fiplex), Bird, Comba, and Fiplex. Other brands may be considered after a thorough technical analysis of the BDA and associated components is performed by the City, and approval is received from the Technical Committee of the ICI System JPA.

VI. CRITICAL AREA:

Critical areas such as the fire command center, the fire pump room, exit stairs, exit passageways, elevator lobbies, below grade parking facilities, standpipe cabinets, sprinkler valve locations, and other areas deemed critical by the fire official shall be provided with ninety-nine percent (95%) floor area radio coverage consistent with NFPA 72, Section 24.5.2.2.1

VII. DELIVERED AUDIO QUALITY:

The ERRC system shall provide a minimum delivered audio quality of level 3.4 (DAQ 3.0) and both uplink and downlink signal strength of -95 dBm on 95% of each floor of the building or structure. DAQ 3.0 constitutes audio quality that makes speech understandable with repetition only rarely required with some noise and distortion.

VIII. BUILDING CONDUIT:

In accordance with the CFC and NFPA 72, all floors (including subterranean parking garages) in new buildings that require the installation of a ERRC system protected with a fire sprinkler system shall be constructed with not less than a two-inch (2”) conduit having a minimum one-hour (1hr) fire resistive rating for the purpose of housing all radio equipment, cabling, antennas, and other infrastructure items appurtenant to the ERRC system. The rise cable has to be in a 2 hour enclosure such as a stairwell. Where installed in buildings, conductors and fiber optic cables shall be installed in accordance with NFPA 70 in any one of the following wiring methods: electrical metallic tubing, Intermediate metal conduit, rigid metal conduit, surface metal raceways, reinforced thermosetting resin conduit(RTRC) or metallic cable trays. A two-hour fire resistive rating shall be required in buildings not protected with a fire sprinkler system. NFPA 1221 5.5.2

IX. POWER SUPPLY SOURCE:

ERRC systems shall be powered with at least two (one primary and one secondary) independent and reliable power sources that conform to NFPA 1221 and the California Electrical Code. The secondary power supply shall be capable of operating the ERRC system for a period of at least 24-hours when the primary power source is inoperable. In the event of a failure of the primary power supply, the ERRC system shall automatically transfer to the secondary power supply without interruption. If a signal booster is used, it shall comply with the requirements of CFC Section 510.4.2.4, and shall be monitored by a supervisory service. It shall also provide automatic supervisory and trouble signals for a failed primary or secondary system in accordance with NFPA.

X. ACCEPTANCE TEST PROCEDURE AND SYSTEM CERTIFICATION:

A system acceptance test report shall be submitted to the fire code official by a person or entity that meets the minimum standards established in CFC Section 510.5.2, maintained on the premises and be made available to the fire official upon request. The report shall verify compliance with CFC Section 510.5.4 and include the ERRC system equipment data sheet, diagram showing device locations, wiring schematic, a copy of the original permit, and a system certification letter. The building owner shall have the radio coverage system tested to ensure that two-way coverage on each floor of the building complies with the requirements of CFC Section 510.4.1, 510.5.3, and this requirement. The fire official shall conduct a final field test to verify the required level of radio coverage and operational efficacy on each floor of the building before the issuance of the Certification of Occupancy or Temporary Certificate of Occupancy.

XI. LOCATION OF EQUIPMENT:

For buildings without a fire command center, the communication control equipment shall be located inside the building near the fire alarm control panel or other approved location.

XII. SIGNAGE:

Buildings equipped with an ERRC system shall be identified by an approved sign located in a conspicuous location as determined by the fire official, stating: "Emergency Responder Radio Coverage System Inside".

XIII. MAINTENANCE:

The ERRC system shall be maintained operational at all times in accordance with CFC Section 510.6 through 510.6.3, and shall be fully inspected annually pursuant to section 510.6.1 CFC.

XIV. CONTINUING OPERATION/SUPERVISION:

The occurrence of any fault in an ERRC system, or when the system function is compromised, a signal to the supervisory service shall be transmitted. If a system is out of service for more than 8 (eight) hours, the fire official shall be notified.

XV. SUPPORTED FREQUENCIES:

ERRC in Monrovia must be compatible with trunked, digital systems combined with conventional and analog systems. A failure to properly pass even a single listed frequency pair will result in the failure of the entire system.

XVI. MONROVIA RADIO FREQUENCIES:

Any building providing an ERRC system shall provide simultaneous coverage for all the following frequency pairs, must be 32 channel capable, employ a Class A BDA, have oscillation detection and prevention circuitry, and employ a squelch or muting feature.

SYSTEM	DOWNLINK	UPLINK	DONOR SITE	CONFIGURATION	MODULATION	POWER (W)	MAX. PROPAGATION DELAY OF BDA & DAS
These frequencies shall be included in every signal booster installation.							
Monrovia Police 1 *	158.7300	155.9700	1	Conventional	Analog	35	15 microseconds
Verdugo Red 12 *	484.2750	487.2750	2	Conventional	Analog	28	15 microseconds
XLC Access **	470.3625	473.3625	3	Conventional	Analog	50	25 microseconds
* Single-Site System							
** Six-Site Simulcast							
Montebello Trunking Cell ***	470.3375	473.3375	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.0375	485.0375	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.1125	485.1125	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.1500	485.1500	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.2125	485.2125	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.2750	485.2750	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.3125	485.3125	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.3750	485.3750	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.4125	485.4125	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.4750	485.4750	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.5125	485.5125	4	Trunking	Project 25 Digital	50	15 microseconds
Montebello Trunking Cell ***	482.6125	485.6125	4	Trunking	Project 25 Digital	50	15 microseconds
*** Six-Site Simulcast							
Required Donor Sites							
Site 1							
Ridgeside Reservoir	34.164536	-117.996238					
Site 2							
700 W. Huntington Dr. Monrovia, CA	34.149440	-118.013940					
Site 3							
Mount Thom 200 West Las Flores Mtwy. Glendale, CA	34.187167	-118.256278					
Site 4							
Montebello Reservoir	34.032500	-118.098056					

When determining the need for the system please keep in mind the following:

Site 1 is used by PD VHF

Site 2 is used for Red 12 (Monrovia Natural Disaster/ Backup Channel)

Site 3 is used for Emergency/ Firefighter Down Incidents

Site 4 is used for our primary dispatch and tactical communications. (Trunked connection to ICI network)

These sites do not talk to one another (Site Roam)