

## Broomfield CO

### TITLE 15 BUILDINGS AND CONSTRUCTION

#### Chapter 15-12 National Electrical Code

#### E. PUBLIC SAFETY RADIO AMPLIFICATION SYSTEM

810-80. Purpose. The purpose of this part is to provide minimum standards to insure a reasonable degree of reliability for emergency services communication from within certain buildings and structures within the city to and from emergency communication centers. It is the responsibility of the emergency service provider to receive the signal to and from the building or structure.

810-81. Scope. The provisions of this article shall apply to:

(a) New buildings and structures of Type I or Type II construction greater than 50,000 square feet or additions or modifications that cause the buildings to be greater than 50,000 square feet.

(b) All basements over 10,000 square feet where the design occupant load is greater than 50, regardless of the occupancy.

(c) For purposes of this section, area separation walls cannot be used to define separate buildings.

(d) Exceptions: A-3, E-2, I-3, R-3 and U occupancies are exempt.

810-82. Radio Coverage. Except as otherwise provided in this article, no person shall erect, construct, or modify any building or structure or any part thereof, or cause the same to be done which fails to support adequate radio coverage for emergency services providers.

(a) After a building permit has been issued, upon request by the owner or the owner's agent, the police department will, within ten to fourteen days, identify the frequency range or ranges that must be supported.

(b) In the event that an emergency service provider modifies its communications equipment in any way that impairs its ability to communicate with an existing system installed in accordance with this part, such agency shall be responsible for all costs associated with reestablishing communications within the affected building or structure.

(c) For purposes of this section, adequate radio coverage shall constitute a successful communications test between the building and the communications centers for all appropriate emergency service providers for the building.

(d) Inbound into the building:

(1) A minimum average in-building field strength of  $8\mu\text{V}(-88\text{ dBm})$  throughout 85% of the area of each floor of the building when transmitted from the police dispatch center and the appropriate emergency service dispatch centers which are providing fire and emergency medical protection services to the building ( $-88\text{ dBm}$  equates to 30 dBu at VHF, 40 dBu at UHF, and 45 dBu at 800 MHZ).

(2) If the field strength outside the building where the receive antenna system for the in-building system is located is less than the -88 dBm, then the minimum required in-building field strength shall equal the field strength being delivered to the receive antenna of the building.

(3) As used in this part, 85% coverage or reliability means the radio will transmit 85% of the time at the field strength and levels as defined in this part.

(e) Outbound from the building: A minimum average signal strength of 4 $\mu$ V (-95 dBm) as received by the police dispatch center and the appropriate emergency service dispatch centers which are providing fire and emergency medical protection services to the building (-95 dBm equates to 24 dBu at VHF, 33 dBu at UHF, and 38 dBu at 800 MHz).

(f) FCC Authorization: If amplification is used in the system, all FCC authorizations must be obtained prior to the use of the system. A copy of these authorizations shall be provided to the city.

#### 810-83. Enhanced Amplification Systems.

(a) Where buildings and structures are required to provide amenities to achieve adequate signal strength, such buildings and structures shall be equipped with any of the following to achieve the required adequate radio coverage: radiating cable systems, internal multiple antenna systems with a frequency range as established in Section 810-82, with amplification systems as needed, voting receiver system, or any other approved system.

(b) If any part of the installed system or systems contains an electrically powered component, the system shall be capable of operation on an independent battery and/or generator system for a period of at least four hours without external power input or maintenance. The battery system shall automatically charge in the presence of external power input.

#### 810-84. Testing Procedures. Method to conduct the tests:

(a) Tests shall be made using frequencies close to the frequencies used by the police and appropriate emergency services. If testing is done on the actual frequencies, then this testing must be coordinated with the police department and appropriate emergency services. All testing must be done on frequencies that are authorized by the FCC. A valid FCC license will be required if testing is done on frequencies different from the police, fire or emergency medical frequencies.

(b) Measurements shall be made using the following guidelines:

(1) With a service monitor using a unity gain antenna on a small ground plane.

(2) Measurements shall be made with the antenna held in a vertical position at 3 to 4 feet above the floor.

(3) A calibrated service monitor (with a factory calibration dated within 24 months) may be used to make the tests.

(4) The special inspector for the city may also make simultaneous measurements to verify that the equipment is making measurements accurately. A variance of  $\pm 3$  dB between the instruments will be allowed.

(5) If measurements in one location are varying, then average measurements may be used.

(c) Initial Tests.

(1) All testing shall be done in the presence of the special inspector for the city.

(2) Signal strength, both inbound and outbound as defined above, shall be measured on each and every floor above and below ground including stairwells, basements, penthouse facilities, and parking areas of the structure. The structure shall be divided into 100-foot grids and the measurements shall be taken at the center of each grid. In critical areas (police substation and fire command post) the grids shall be reduced to 25 feet. The size of the grids may also be reduced upon recommendations of the special inspector, in areas where displays, equipment, stock, or any other obstruction may significantly affect communications in those areas.

(d) Annual Tests.

(1) Annual tests will be conducted by the fire department or the police department or both. If the 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.

(2) If the degradation to the system is due to building additions or remodeling, 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 in order to obtain a final inspection for occupancy.

(3) Any system degradation or failure not related to the performance of the owners on-site system will be the responsibility of the appropriate emergency service agency.

(Ord. 1013 §1, 1993; Ord. 1196 §14, 1996; Ord. 1411 §1, 1999; Ord. 1568 §13, 2001)