



Menlo Park Fire Protection District Fire Prevention Bureau

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MENLO PARK FIRE PROTECTION DISTRICT STANDARD SECTION 916 FIREFIGHTER RADIO SIGNAL AMPLIFICATION SYSTEMS

916.1 Scope. The design installation and maintenance of Firefighter Radio Signal Amplification Systems shall be in accordance with this section.

916.2 Required installations. A Radio Signal Amplification System shall be installed in new buildings or structures four or more stories in height and any underground structures that are two or more floors below grade.

When the radio signal in any new or existing building or structure does not meet the performance standard in Section 916.3 a Radio Signal Booster System shall be installed.

Exception: Single family dwellings are not required to install of Firefighter Radio Signal Amplification Systems.

916.3 Radio coverage requirements. Radio signals shall meet the following performance criteria.

916.3.1 Minimum radio coverage into buildings. There shall be a minimum signal strength of -95dBm throughout 90% of the area of each floor of the building when transmitted from the San Mateo County Public Safety Communications Center.

916.3.2 Minimum signal strength out of the building. There shall be a minimum signal strength of -95dBm measured at the San Mateo County Public Safety Communications Center.

916.4 Amplification Systems Allowed. A Radio Signal Amplification System consisting of an exterior antenna, a FCC Type accepted Bi-Directional Amplifier system, an in-building antenna or radiating cable system, or other systems approved by Menlo Park Fire District that achieve compliance with Section 916.3.

916.5 Electrical requirement. The amplification or signal booster system shall be capable of operating on an independent battery and/or generator system for a period of at least twelve (12) hours without external power input. The battery system shall automatically charge in the presence of an external power input. There shall be no connectivity between the amplification system and fire alarm system.

916.6 Protection from moisture. Where amplification, signal booster components, and battery systems are used, they shall be contained in NEMA 4 type waterproof cabinets. Permanent external filters and attachments are not permitted.

Exception: Elevator shafts.

916.7 Frequency operation. A firefighter radio amplification or booster system shall be designed to operate in the VHF, UHF, 700 and 800 megahertz (MHz) bands.

916.7.1 Additional frequencies and change of frequencies. The building owner will be required to modify or expand the firefighter radio amplification in-building system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of an in-building system on previous frequencies does not exempt this section.

(This is an advisory statement that the building owner may select equipment and distribution components that are capable of such changes.)

916.7.2 Approval Prior to Installation. No amplification system capable of operating on frequencies licensed to the agency by the FCC shall be installed without prior coordination and approval of the Menlo Park Fire District. This is a FCC requirement.

916.8 Other wireless communication systems. No existing or future wireless communications facilities shall interfere with any public safety radio communications systems. Wireless communications facilities, as referred to herein, shall include, but are not limited to, satellite dishes, antennas, cellular phone facilities and similar wireless communication structures or systems.

916.9 Acceptance tests. When an in-building radio system is required, upon completion of installation the radio system, and prior to issuance of certificate of occupancy, the property owner shall provide for testing to ensure that two-way coverage on each floor of the building is a minimum of ninety (90) percent.

916.9.1 Floor testing. Each floor of the building shall be divided into a grid of approximately twenty (20) equal areas. A maximum of two (2) of the areas will be allowed to fail the test. In the event that three (3) of the areas fail the test, in order to be more statistically accurate, the floor may be divided into forty (40) equal areas. A maximum of four (4) areas will be allowed to fail the test. After the forty (40) area test, if the system continues to fail, it will be the building owner's responsibility to have the system altered to meet the ninety (90) percent coverage requirement.

The data system test shall be conducted using a laptop computer communicating with the computer aided dispatch system. A spot approximately in the center of the grid area will be selected for the test, then the radio will be keyed to verify two-way communications to and from the outside of the building through the San Mateo County Public Safety Communications system. Once the spot has been selected prospecting for a better spot in the grid area will not be permitted.

916.9.2 Equipment used. The voice test shall be conducted using a portable radio with specifications equivalent to the personnel portable radios used by Menlo Park Fire District, talking through the San Mateo County Public Communications Center.

916.9.3 Test results. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified each year during the annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values. Copies of all tests shall be forwarded to the Menlo Park Fire District, Fire Prevention Division.

916.9.4 Annual Tests. When an in-building radio system is required, it shall be the building owner's responsibility to have all active components of the system, such as signal boosters, power supplies and backup batteries tested to a minimum of once every 12 months. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period, and in the opinion of the agency's representative, the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the integrity of the battery can be determined. All other active components shall be checked to determine that they are operating within the manufacturers specifications for the intended purpose.

916.9.5 Retransmission equipment. Where radio "retransmission" equipment is required, an annual test shall be performed as described in this Section to ensure that the building continues to meet the radio coverage requirements of this section. A copy of test results shall be kept on record by the property owner and available for inspection at any time by the fire code official.

916.9.6 Contractor qualifications. Personnel conducting acceptance and annual radio system tests shall be qualified to perform the work. All tests shall be documented and signed by a person in possession of a current FCC license, a current technician certification issued by the Associated Public Safety Communications Officials International (APCO), or the Personal Communications Industry Association (PCIA).

916.10 Inspections. The fire code official shall have the right to enter onto the property to inspect and to conduct field-testing at all reasonable times to be certain that the required level of radio coverage is present.