



RFDS 18.00; Emergency Responder Radio Coverage Systems

18.1; Emergency Responder Radio Coverage – Where Required

Approved radio coverage for emergency responders shall be required within new buildings meeting any of the following conditions:

1. More than five stories above grade plane as defined by the 2015 International Building Code (IBC), section 202.
2. The total building area is 50,000 square feet or more.
3. The total basement area is 10,000 square feet or more.
4. There are floors used for human occupancy more than 30 feet below the finish floor of the lowest level of exit discharge.
5. The fire code official determines that acceptable radio coverage is needed for the safety and effectiveness of emergency responders.

18.2; Pre-Existing Buildings

The fire code official may require pre-existing buildings to provide emergency responder radio coverage under the following circumstances:

1. Existing buildings that undergo renovation, restoration, or significant modification to the original structure and meet any of the conditions listed in 18.1.
2. Any building where it is determined by the fire code official that acceptable radio coverage is needed for the safety and effectiveness of emergency responders.

18.3; Determination of Acceptable Radio Coverage

If a building meets any of the conditions listed in 18.1 or 18.2, that building shall be tested for acceptable radio coverage per the test procedures listed in the 2015 International Fire Code (IFC), section 510.5.3, prior to issuance of the building's certificate of occupancy. Testing for acceptable radio coverage shall be completed after the building's exterior is deemed weathertight. Following the signal strength test for emergency radio coverage, a written report shall be submitted to the fire code official. The written report shall include the complete test results as described in IFC 510.5.3 and a determination of acceptable radio signal strength per IFC 510.4.1.

Buildings that undergo the test procedure described in IFC 510.5.3 and are determined to not have acceptable radio signal strength per IFC 510.4.1 shall install an emergency responder radio system that provides acceptable radio signal strength in accordance with IFC 510.4.2. In addition, the building shall be required to meet all maintenance requirements including annual inspection and testing in accordance with IFC 510.6 for the life of the building.

Buildings that install a required emergency responder radio system shall conduct annual tests in accordance with IFC 510.6.1 for the life of the building. If the annual test indicates new or additional locations within the building that do not have acceptable



radio coverage per IFC 510.4.1, those areas must be provided with an emergency responder radio system that meet the requirements of acceptable radio strength per IFC 510.4.

18.4: System Design Requirements

18.4.1 General Requirements: Buildings and structures determined to have unacceptable radio signal strength per IFC 510.4.1 shall provide an emergency responder radio system that meets the system design requirements of IFC 510.4.2.

18.4.2 Signal Strength: The minimum signal strength shall meet the requirements listed in IFC 510.4.1.

18.4.3 Identification:

- Doors into rooms or buildings containing an emergency responder radio system shall be provided with approved signs stating "Emergency Responder Radio System."
- Buildings equipped with an emergency responder radio system shall have signage at fire alarm panel that states, "This building is equipped with an emergency responder radio coverage system."

18.4.4 Frequency Ranges: The frequency ranges which must be supported shall be

- *Uplink:* 806 MHz–824 MHz
- *Downlink:* 851 MHz–869 MHz
- *Additional frequency ranges may be added in the future as determined by the authority having jurisdiction.
- For specific radio frequencies, channels, and rebroadcast agreement, contact the Eastside Public Safety Communications Agency (EPSCA) at 425-556-2516.

18.4.5 Frequency Changes: The building owner shall modify or expand the frequency range at his or her expense in the event frequency changes are required by the Federal Communications Commission (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 requirement. (IFC 510.4.2.5 and 510.6.2)

18.4.6 Power Supply.

18.4.6.1 **Power supply:** Shall conform to the 2013 NFPA 72, section 10.6 *Power Supplies.*

18.4.6.2 **Standby power supplies:** If any part of the installed system or systems contains an electrically powered component, the installed system or systems shall be provided with standby power in accordance with IFC 604 for a duration of not less than twenty-four (24) hours. (IFC 510.4.2.3)

18.4.6.3 **Signal booster requirements.** If used, signal boosters shall meet all requirements of IFC 510.4.2.4.

18.4.6.4 **Required licensee approval.** No amplification system capable of operating on frequencies used by the regional 800 MHz radio system shall be installed without prior coordination and approval of the radio



system licensee (the Eastside Public Safety Communications Agency) and any such system must comply with any standards adopted by the King County Regional Communications Board.

18.4.7 Fire Alarm Monitoring: The system shall be supervised by the building fire alarm system to provide automatic alarming for the following trouble conditions:

1. Malfunction of the RF signal booster
2. Antenna malfunctions
3. Loss of AC power
4. Backup battery charger failure
5. The signal booster system and battery system shall be electrically supervised and monitored by a supervisory service or when approved by the fire code official, shall sound an audible signal at a constantly attended location.

These conditions may be grouped into a trouble signal that is annunciated at the fire alarm panel and at central station. The signal shall be identified as an "emergency responder radio" trouble signal. They will be tested by a Redmond Fire Department inspector at the time of final inspection of this permit.

18.5; Permits

18.5.1 Installation Permit: A construction permit is required for installation of or modification to an emergency responder radio system and related equipment as specified in IFC 105.7.5. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

18.5.2 Operational Permit: An annual operational permit is required to operate an emergency responder radio coverage system as described in IFC 510. (Redmond Municipal Code 15.06.103(9), which adds 105.6.52 to the IFC)

18.5.3 Other Permits: A low-voltage electrical permit is required for installation of an emergency responder radio system and shall be approved by an electrical inspector prior to requesting a fire department fire alarm final inspection.

18.5.4 Installation Permit Submittal Requirements: The following list of information is required on all plan submittals for an emergency responder radio system:

- Building Plan: The applicant is required to submit all of this information so an accurate and timely review may be done. The plan shall be drawn to 1/8" = 1'-0" minimum scale and shall include the following:
 1. Location of signal booster and confirmation that the system will be installed in a NEMA 4 waterproof cabinet
 2. Location of backup battery system if being used
 3. Location of antennas
 4. Floor diagrams for each floor with current signal strength
- Completed *fire installation permit application*



- Completed *emergency responder radio submittal checklist*. Check all checkboxes that are applicable to your project.
- Site plan
- EPSCA authorization letter (contact EPSCA @ 425-556-2516)
- Manufacturer's cut sheets for NEMA 4 cabinet, battery backup (if using battery backup as standby power) and other equipment being installed.
- Proof of a valid FCC-issued general radio operator's license (IFC 510.5.2)
- A certification of in-building system training issued by a nationally recognized organization/school or by the manufacturer of the equipment being installed. (IFC 510.5.2)

18.8; New Install; Final Inspection items

- Acceptance test report: Following an acceptance test per IFC 510.5.3, a report shall be submitted a minimum of one week prior to the on-site inspection and indicate that the building meets minimum acceptable radio strength with either a 20- or 40-grid test.
- Confirmation of NEMA 4 installation
- Confirmation of 24-hour backup power
- Final EPSCA paperwork, to include uplink and downlink
- Proper signage near fire alarm panel and on doorway to equipment
- Site plan posted near fire alarm panel
- Alarm signals confirmed with central station
- The signal booster plug is secured in a way that it does not accidentally fall out of the electrical outlet

A certificate of occupancy will not be issued to any structure if the building fails to comply with these provisions.

18.9; MAINTENANCE

The emergency responder radio system shall be maintained and be operational at all times in accordance with IFC 510.6.

18.9.1 Annual Inspection and Testing: It shall be the building owner's responsibility to have all active components of the system, such as amplifiers, power supplies and backup batteries inspected and tested a minimum of once every twelve (12) months. Testing shall comply with IFC 510.6 and a report shall be submitted to the fire code official or the designee. The report shall include, at minimum, the list of inspected items, a floor plan, and the signal strength in various locations of the building.

If additional areas of the building are determined not to have acceptable radio strength, the owner will be required to improve the system to provide acceptable radio coverage.



18.9.2 **CHANGES TO THE BUILDING:** Each owner shall submit a field performance test whenever structural changes occur to the building that would materially change the original field performance tests by a consultant approved by the fire code official. The performance test shall comply with IFC 510.6.1. It shall include, at minimum, a floor plan and the signal strength in various locations of the building.

18.10; Field Testing

Police Department and Fire Department personnel shall, at any reasonable time, have the right to enter the property to conduct field testing to be certain that the required level of radio coverage is present.