RFDS 18.00; EMERGENCY RESPONDER RADIO COVERAGE SYSTEMS

18.1; EMERGENCY RESPONDER RADIO COVERAGE

Except as otherwise provided no person shall maintain, own, erect, or construct, any building or structure or any part thereof, or cause the same to be done which fails to support adequate radio coverage for City emergency services workers, including but not limited to firefighters and police officers.

Exceptions:

1. Single family residential buildings
2. Buildings constructed primarily of wood frame without below grade storage or parking areas

Existing buildings that do not have approved radio coverage for emergency responders within the building, shall be equipped with such coverage within a time frame established by the Fire Code Official.

18.1.1; ADEQUATE RADIO COVERAGE.

Minimum signal strength of -95 dBm available in 95% of all areas of the building and 99% in elevators (measured at the primary recall floor), stair shafts and Fire Command Centers when transmitted from the closest Regional 800 MHz. Radio System.

18.1.2; MINIMUM SIGNAL STRENGTH.

Minimum signal strength of -100 dBm shall be received by the Regional 800 MHz. Radio System when transmitted from 95% of all areas of the building and 99% in elevators (measured at the primary recall floor), stair shafts and Fire Command Centers.

18.1.3; FREQUENCY RANGE.

The frequency range which must be supported shall be 806 MHz to 824 MHz and 851 MHz. to 869 MHz. and such other frequencies as determined by the Regional Radio System operator in all areas of the building.

The building owner shall modify or expand the frequency range 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 requirement.

Point of Information

System designers should be aware that re-banding (Nextel) is currently well along making available the entire 800 MHz spectrum as well as portions of the 700 MHz band for public safety and equipment must be capable of supporting these and other spectrum bands. See www.FCC.gov for additional information.

18.2; PERMITS

18.2.1; CONSTRUCTION PERMIT.

A construction permit is required for installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

18.2.2; OPERATIONAL PERMIT.

An operational permit is required to operate an in building radio system.

18.3; POWER SUPPLY.

Power supplies shall conform to the 2010 NFPA 72, Section 10.5 (Power Supplies).

18.4; SIGNAL BOOSTER REQUIREMENTS.

If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4-type waterproof cabinet.
2. The battery system shall be contained in a NEMA4-type waterproof cabinet.
3. The system shall include automatic alarming of malfunctions of the signal booster and battery system. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72 or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC certification prior to installation.

18.5; PROOF OF COMPLIANCE AND TESTING

18.5.1; PROOF OF COMPLIANCE.

Each owner shall submit at least one field test, or as determined by the fire code official, 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 include at minimum a floor plan and the signal strength in various locations of the building.

18.5.2; ANNUAL TEST.

It shall be the building owner's responsibility to have all active components of the system, such as amplifiers, power supplies and backup batteries tested a minimum of once every twelve (12) months. Testing shall consist of the following:

1. Amplifiers shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.
2. 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 testing technician, 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.

3. All other active components shall be checked to determine that they are operating within the manufactures specification for the intended purpose.

A report shall be submitted to the fire code official upon conclusion of the testing and not later than January 30th of each year.

18.5.3; FIVE YEAR TESTS
In addition to the annual test, it shall be the building owner's responsibility to perform a radio coverage test a minimum of once every five (5) years to ensure that the radio system continues to meet the requirements of the original acceptance test. A report shall be submitted to the fire code official upon conclusion of the testing.

18.5.4; QUALIFICATION OF PERSONNEL.
The system designer, lead installation personnel and personnel conducting radio system tests shall be qualified to perform the work.

Design documents and all tests shall be documented and signed by a person in possession of a current FCC General Radio Telephone Operator License and

1. A current technician certification issued by the Associated Public Safety Communications Officials International (APCO) or
2. The National Association of Business and Education Radio (NABER) or
3. The Personal Communications Industry Association (PCIA) or
4. Certificate holder issued by the manufacturer of the equipment being installed.

18.6; INADEQUATE RADIO COVERAGE.

Buildings and structures which cannot support the required level of radio coverage shall be equipped:

1. A radiating cable system and/or
2. An internal multiple antenna system with FCC certificated bi-directional 800 MHz amplifiers or
3. Systems otherwise approved by the city radio system manager in order to achieve the required adequate radio coverage In the event that a signal booster is employed, it shall be fully encased with a NEMA 4 (or equivalent) dust/waterproof rated enclosure, and filters that reject adjacent frequencies in addition to the multi-bandpass filters.

18.7; SECONDARY POWER.

If any part of the installed system or systems contains an electrically powered component, the installed system or systems shall be provided with an independent battery system or an emergency generator capable of operating for a period of at least twenty four (24) hours without external power input. The battery system shall automatically charge in the presence of external power input.

18.8; APPROVAL PRIOR TO INSTALLATION.

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.

18.9; ACCEPTANCE TESTS.

Acceptance testing for Emergency responder radio amplification system is required, upon completion of installation. It is the building owner's responsibility to have the radio system tested by qualified personnel to ensure a minimum of 95% two-way coverage on each floor of the building.

Point of Information:

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

Talk-back testing from a site to the Regional 800 MHz. Radio System shall use a two (2) watt, portable transceiver with speaker/microphone and flexible antenna (or any calibrated device which will produce signal levels useable by the prescribed portable radio). Field strength testing instruments must have been calibrated within one (1) year of the date of the acceptance test. Field strength testing instruments must be of the frequency selective type incorporating a flexible antenna similar to the ones used on the hand held transceivers. City Radio System Manager may designate alternate methods of measuring the signal level, which satisfy appropriate levels of public safety coverage.

A report shall be submitted to the Redmond Fire Prevention Division at the conclusion of acceptance testing containing a floor plan and the signal strengths at each location tested and other relevant information. A representative of the Redmond Fire Prevention Division may oversee the acceptance test. Acceptance testing is also required whenever changes occur to the building that would materially change the original field performance test.

18.10; TESTING CRITERIA.

Each floor of the building shall be divided into a grid of approximately forty (40) equal areas. A maximum of two (2) nonadjacent areas will be allowed to fail the test. In the event that three (3) of the areas fail the test, the floor may be divided into eighty (80) equal areas in order to be more statistically accurate. In such event, a maximum of four (4) nonadjacent areas will be allowed to fail the test. After the eighty (80) area tests, if the system continues to fail, the building owner shall have the system altered to meet the 95% coverage requirement.

A spot located approximately in the center of a grid area will be selected for the test, then the radio will be keyed to verify two-way communication to and from the outside of the building through the Regional 800 MHz. Radio System. Once the spot has been selected, prospecting for a better spot within the grid area is not permitted. The gain values of all amplifiers shall be measured and the results 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.

Point of Information:

While the foregoing implies manual measurement and recording, automated testing and recording is certainly permitted so long as a report can be produced documenting the signal strength (or average) in each test square.

18.11; IDENTIFICATION.

Buildings equipped with an Emergency Responder Radio Coverage system shall be identified by a sign located on or near the Fire Alarm Control Panel stating “This building is equipped with an Emergency Responder Radio Coverage System”

18.12; FIELD TESTING.

Police and Fire Personnel shall at any time have the right to enter onto the property to conduct its own field-testing to be certain that the required level of radio coverage is present.