



CITY OF LACEY
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

CASH OR CHECK ONLY PLEASE

EMERGENCY RESPONDER RADIO SIGNAL PERMIT APPLICATION

FOR INSTALLATION/MODIFICATION OF EMERGENCY RESPONDER RADIO SIGNAL RELAY EQUIPMENT

NOTE: PLEASE INCLUDE THREE (3) SETS OF COMPLETE AND SCALED FLOOR PLANS FOR EMERGENCY RESPONDER RADIO SIGNAL STRENGTH TESTING FOR EACH FLOOR LEVEL.

Project Address _____ Parcel Number _____

Building Area (Sq. Ft.) _____ Number of zones (floor levels) _____

Building Owner _____ Phone Number _____

Address _____ City _____ State _____ Zip Code _____

Project Contact Person _____ Phone Number _____

Cell Phone _____ E-mail _____

Address _____ City _____ State _____ Zip Code _____

Contractor _____ Phone _____

Address _____ City _____ State _____ Zip _____

E-mail _____

Contractor's License Number _____ Expiration _____ City Bus. Reg. _____

I hereby certify that the above information is correct and that the construction on, and the occupancy and the use of the above-described property will be in accordance with the laws, rules and regulations of the State of Washington.

Applicant's Signature

Date

Print Applicant's Name

CITY OF LACEY EMERGENCY RESPONDER RADIO COVERAGE PACKET

The information in this packet provides all City of Lacey Emergency Responder Radio Coverage requirements. Read the packet and sign and date on the last page and submit with the Emergency Responder Radio Coverage permit.

This is to advise you THE City of Lacey requirements for Emergency Responder Radio Coverage as determined by the Lacey Fire Department/ City of Lacey Fire Code Official. In accordance with Section 510.1 of the International Fire Code (IFC-2015 Edition), all buildings shall have approved radio coverage for emergency responders including Lacey Fire Dept. and Lacey Police within the building based on existing coverage levels of the public safety communications system.

As result of this finding, modifications shall be provided for emergency responder radio transmission to and from all areas within the building. Said modifications shall be evaluated by persons properly trained and qualified personnel having a valid FCC-issued general radio operator's license, certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed, to determine the necessary modifications to be provided.

The building owner shall modify or expand the frequency range as necessary at his or her expense in the event frequency charges 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 is currently required making available the entire 150-160 VHF spectrum for public safety and equipment must be capable of supporting these and other spectrum. Emergency Responder Radio Coverage must be capable of supporting these and other spectrum.

The property owner shall submit an application for a building permit at the City of Lacey Building Department 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.

International Fire Code (IFC-2015 Edition) Requirements

510.1 Emergency responder radio coverage in buildings. All buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels or the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where approved by the City of Lacey Fire Code Official, a wired communication system in accordance with IFC Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an approved radio coverage system.
2. Where it is determined by the City of Lacey Fire Code Official that the radio coverage system is not needed.

510.2 Radio Signal Strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements of IFC Sections 510.2.1 and 510.2.2.

510.2.1 Minimum Signal Strength: A minimum signal strength of -95 dBm shall be receivable within the building.

510.2.2 Minimum Signal Strength Out of the Building. A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

510.3 Emergency Responder Radio Coverage in Existing Buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Wherever existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with IFC Section 510.1, Exception #1.
2. Within a time frame established by the adopting authority.

510.1. Emergency Responder Radio Coverage in Buildings. 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. In accordance with this IFC Section, all buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communications system of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Single family residential buildings.
2. Buildings, having 50,000 square-feet or less floor area, constructed primarily of wood frame without below grade storage or parking areas.
3. Buildings thirty-five (35) feet or less in height (as determined by Section 502 of the *International Building Code*) or less without below grade storage or parking areas. Should construction that is thirty-five (35) feet high or less includes subterranean storage or parking, then this ordinance shall apply only to the subterranean areas unless the fire chief determines that emergency responder radio coverage is not needed because of the size of configuration or the subterranean area.
4. Preexisting buildings: Buildings constructed prior to the implementation of this section shall not be required to comply with emergency responder radio coverage provisions of this section unless the Lacey Fire Code Official is concerned that the architectural features of the building or current use would obstruct emergency responder radio signals. Should exempted structures undergo renovation, restoration, or significant modification to the original structure, exemption from the provisions of this ordinance shall not apply.

510.1.1 Adequate Radio Coverage. A 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 150-160 VHF Radio System.

510.1.2 Minimum Signal Strength. A minimum signal strength of -100 dBm shall be received by the Regional 150-160 VHF Radio System then 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*.

510.1.3 Frequency Range. The frequency range which must be supported shall be 150-160 VHF 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 charges 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.

510.2 Permits.

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

510.2.2 Operational Permit. An operational permit is required to operate an in-building radio system in accordance with LMC 14.07.015.

510.3 Power Supply. Power supplies shall conform to Sections 10.4.10 and 10.5, NFPA 72 (2007 Edition).

510.4 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 NPA 72 or, when approved by the Lacey Fire Code Official, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC certification prior to installation.

510.5 Proof of Compliance and Testing.

510.5.1 Proof of Compliance. Each owner shall submit at least one field test, or as determined by the Lacey 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 Lacey Fire Code Official. The performance test shall include at minimum a floor plan and the signal strength in various locations of the building.

510.5.2 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 manufacturers specifications for the intended purpose.

A report shall be submitted to the City of Lacey Fire Code Official upon conclusion of the testing and not later than January 30th of each year.

510.5.3 Five-year Tests. In addition to the annual test, it shall be the building owner's responsibility to perform radio coverage tests 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.

510.5.4 Qualifications of Personnel. The system designer, lead installation personnel and personnel conducting radio system tests shall 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 a certificate or certification issued by the:

1. Associated Public Safety Communications Officials International (APCO), or
2. National Association of Business and Education Radio (NABER) or
3. Manufacturer of the equipment being installed.

510.6 Inadequate Radio Coverage. Buildings and structures which cannot support the required level of radio coverage shall be equipped with:

1. A radiating cable system and/or
2. An internal multiple antenna system with FCC certificated bi-directional 150-160 VHF 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-band pass filters.

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

510.8 Approval Prior to Installation. No amplification system capable of operating on frequencies used by the Regional 150-160 VHF Radio System shall be installed without prior

coordination and approval of the radio system licensee (Capital Communications) and any such system must comply with any standards adopted by the Thurston County Communications board (CAPCOM).

510.9 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.

Talk-back testing from a site to the Regional 150-160 VHF Radio System shall use a two (2) watt, portable transceiver. With speaker/microphone and flexile antenna (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 or the frequency selective type incorporating a flexible antenna similar to the ones used on the hand held transceivers. The CAPCOM 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 Lacey Fire Department at the conclusion of acceptance testing containing a floor plan and the signal strength at each location tested and other relevant information. A representative of the Lacey Fire Department 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.

510.10 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 nonadjacent areas will be allowed to fail the test. After the eighty (80) areas tests, if the system continues to fail, the building owner shall have the system altered to meet the 95% coverage requirements.

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 150-160 VHF 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 test. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain value.

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.

510.11 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".

512.12 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.

**SIGN THE PACKET BELOW ACKNOWLEDGING CITY OF LACEY
EMERGENCY RESPONDER RADIO REQUIREMENTS.**

PROJECT ADDRESS: _____

INSTALLING CONTRACTOR: _____

SIGNATURE: _____

DATE: _____

If you are in need of further assistance, please call me at (360) 456-7783.

Respectfully,

TERRY MCDANIEL
Fire Code Specialist
City of Lacey

LISTING IS FROM MOBILE OR PORTABLE PROGRAMMING PERSPECTIVE

STANDARD PUBLIC SAFETY FREQUENCIES IN USE IN THURSTON COUNTY, WASHINGTON

THURSTON COUNTY LAW ENFORCEMENT RADIO CHANNELS

DESCRIPTION	TRANSMIT	TX/PL	RECEIVE	RX/PL	Motorola PL Code	RPTR	FCC LICENSE	NOTES:
TAC 1 (SIMULCAST)	154.830 MHZ	136.5 Hz	155.550 MHZ	136.5 Hz	4Z	RPTR	KQT456, WNCZ894, WQDD356,	THURSTON COUNTY SHERIFF, YELM PD, OTHER
TAC 2	155.070 MHZ	88.5	156.150 MHZ	88.5	YB	RPTR	KNAS381, KQ4369, WNWZ894	LACEY, AND TUMWATER P.D. (CITY)
TAC 3	155.010 MHZ	88.5	155.010 MHZ	88.5	YB		KNAS381, KQ4369	OLYMPIA PD CAR TO CAR
DATA CHANNEL	155.985 MHZ	146.2 Hz	154.875 MHZ	146.2 Hz	4B	RPTR	WPKB953 MAIN, AND WNWZ894	
TAC 5	154.800 MHZ	88.5	154.800 MHZ	88.5	YB		KQ4369, KNAS381, WNWZ894	T.C. SHERIFFS CAR TO CAR (TCOMM RX ONLY)
L.E.R.N.	155.370 MHZ	100	155.370 MHZ	CSQ	1Z		KNGF889	STATEWIDE LAW ENFORCEMENT INTEROPERABILITY (NOTE: PIERCE COUNTY WONT INCLUDE CTCSS REQUIRING CSQ.)
TAC 9	155.9175 MHZ	107.2	158.8575 MHZ	107.2	1B	RPTR	WQBH840	OLYMPIA PD REPEATER
WSP OLYMPIA INTEROP			154.920 MHZ				KOA590 WSP CAPITOL PEAK	TCOMM RECEIVE ONLY. APCO P25 DIGITAL

THURSTON COUNTY FIRE SERVICE RADIO CHANNELS

DESCRIPTION	TRANSMIT FREQ	TX/PL	RECEIVE FREQ	RX/PL	Motorola PL Code	RPTR	FCC LICENSE	NOTES:
FIRE 1	154.430 MHZ	88.5	154.430 MHZ	88.5	YB		KQT456, WNWZ894, WQDD356,	PRIMARY FIRE ALERTING TWO-TONE
FIRE 2 (OFD)	154.370 MHZ	173.8	154.370 MHZ	173.8	6A		WPQK923	OLYMPIA FIRE DEPARTMENT
FIRE 3 (T.F.D.)	153.800 MHZ	94.8 Hz	153.800 MHZ	94.8 Hz	ZA		WQPK923	TUMWATER FIRE DEPARTMENT
FIRE 4 (SIMPLEX)	154.010 MHZ	203.5 Hz	154.010 MHZ	203.5 Hz	M1		KQT456, WNWZ894, WQDD356,	SIMPLEX OF FIRE CHANNEL 5 REPEATER
FIRE 5 (SIMULCAST)	150.775 MHZ	203.5 Hz	154.010 MHZ	203.5 Hz	M1	RPTR	KQT456, WNWZ894, WQDD356,	PRIMARY FIRE GROUND OPERATIONAL FREQUENCY
FIRE 6 (SIMULCAST)	150.805 MHZ	77.0 Hz	154.175 MHZ	77.0 Hz	XB	RPTR	KQT456, WNWZ894, WQDD356,	LACEY FIRE DIST 3 PRIMARY FIRE GROUND
FIRE 7 (SIMPLEX)	154.175 MHZ	77.0 Hz	154.175 MHZ	77.0 Hz	XB		KQT456, WNWZ894, WQDD356,	SIMPLEX OF FIRE CHANNEL 6 REPEATER
FIRE 8 (REDNET)	153.830 MHZ	none	153.830 MHZ	none			WQAC587	STATE INTEROP CHNL (A.K.A. ST CHIEFS / RED NET)
FIRE 9 (OFDTAC)	151.0025 MHZ	88.5	151.0025 MHZ	88.5	YB		KFE781	OLYMPIA FIRE DEPARTMENT