



STATE OF WASHINGTON  
**STATE BUILDING CODE COUNCIL**

May 2018  
Log No. \_\_\_\_\_

**1. State Building Code to be Amended:**

- |   |   |
|---|---|
| <input type="checkbox"/> International Building Code          | <input type="checkbox"/> International Mechanical Code        |
| <input type="checkbox"/> ICC ANSI A117.1 Accessibility Code   | <input type="checkbox"/> International Fuel Gas Code          |
| <input type="checkbox"/> International Existing Building Code | <input type="checkbox"/> NFPA 54 National Fuel Gas Code       |
| <input type="checkbox"/> International Residential Code       | <input type="checkbox"/> NFPA 58 Liquefied Petroleum Gas Code |
| <input checked="" type="checkbox"/> International Fire Code   | <input type="checkbox"/> Wildland Urban Interface Code        |
| <input type="checkbox"/> Uniform Plumbing Code                |   |

For the Washington State Energy Code, please see specialized [energy code forms](#)

**Section(s):**

**Title:**

**2. Proponent Name (Specific local government, organization or individual):**

**Proponent:** 2024 International Fire Code Technical Advisory Group

**Title:** TAG Member

**Date:** 9/17/2024

**3. Designated Contact Person:**

**Name:** Ricky Campbell

**Title:**

**Address:**

**Office Phone:** ( )

**Cell:** (206) 681-8406

**E-Mail address:** ricky@ualocal699.org

**4. Proposed Code Amendment.** Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code, additional pages may be attached.

Clearly state if the proposal modifies an existing amendment or if a new amendment is needed. If the proposal modifies an **existing amendment**, show the modifications to the existing amendment by underlining all added language and striking through all deleted language. If a new amendment is needed, show the modifications to the **model code** by underlining all added language and striking through all deleted language.

**Code(s) IFC**      **Section(s) 510**

Enforceable code language must be used.

Amend section to read as follows:

**SECTION 510—EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEMS (ERCES)**

**510.1 Emergency responder communications enhancement systems in new buildings.** Approved in-building emergency responder communications enhancement system (ERCES) for emergency responders shall be provided in all new buildings. In-building ERCES within the building shall be based on the existing coverage levels of the public safety communications systems utilized by the jurisdiction, measured at the exterior of the building. The ERCES, where required, shall be of a type determined by the fire code official and the frequency license holder(s). This section shall not require improvement of the existing public safety communications systems.

Exceptions:

1. Where approved by the building official and the fire code official, a wired communications system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an approved communications coverage system.
2. Where it is determined by the fire code official that the communications coverage system is not needed.
3. In facilities where emergency responder communications coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder communications coverage system.
4. One-story buildings not exceeding 12,000 square feet (1115 m<sup>2</sup>) with no below-ground area(s).

**510.2 Emergency responder communications enhancement system in existing buildings.** Existing buildings shall be provided with approved in-building emergency responder communications enhancement system for emergency responders as required in Chapter 11.

**510.3 Permits.** Permits for in-building emergency responder communications enhancement systems shall be in accordance with Sections 510.3.1 and 510.3.2. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

**510.3.1 Permit required.** A construction permit for the installation of or modification to in-building emergency responder communications enhancement systems and related equipment is required as specified in Section 105.6.5. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

**510.3.2 Operational permit.** Where required by the fire code official, an operational permit shall be issued for the operation of an in-building emergency responder communications enhancement system.

**510.4 Technical requirements.** Equipment required to provide in-building emergency responder communications enhancement shall be listed in accordance with UL 2524. Systems, components and equipment

required to provide the in-building emergency responder communications enhancement system shall comply with Sections 510.4.1 through 510.4.2.8.

**510.4.1 Emergency responder communications enhancement system signal strength.** The building shall be considered to have an acceptable in-building emergency responder communications enhancement system where signal strength measurements in 95 percent of all areas and 99 percent of areas designated as critical areas by the fire code official on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.

**510.4.1.1 Minimum signal strength into the building.** The minimum downlink signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the fire code official. The ~~inbound~~ downlink signal level shall be a minimum of -95 dBm in 95 percent of the coverage area and 99 percent in critical areas and sufficient to provide not less than a delivered Audio Quality (DAQ) of 3.0 ~~or an equivalent~~ throughout the coverage area using either narrow-band analog, digital or wideband LTE signals or an equivalent bit error rate (BER), or signal-to-interference-plus-noise ratio (SINR) applicable to the technology for either analog or digital signals.

**510.4.1.2 Minimum signal strength out of the building.** The minimum uplink signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the fire code official. The uplink signal level shall be a minimum of -95 dBm in 95 percent of the coverage area and 99 percent in critical areas sufficient to provide not less than a delivered audio quality (DAQ) of 3.0 using either narrowband analog, digital or wideband LTE digital signals or an equivalent bit error rate (BER), or an equivalent SINR applicable to the technology for either analog or digital signals.

**510.4.1.3 System performance.** Signal strength shall be sufficient to meet the requirements of the applications being utilized by public safety for emergency operations through the coverage area as specified by the fire code official in Section 510.4.2.2.

**510.4.2 System design.** The in-building emergency responder communications enhancement system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1225.

**510.4.2.1 Amplification systems and components.** Buildings and structures that cannot support the required level of in-building emergency responder communications enhancement system shall be equipped with systems and components to enhance the radio signals and achieve the required level of in-building emergency responder communications enhancement system specified in Sections 510.4.1 through 510.4.1.3. In-building emergency responder communications enhancement systems utilizing radio-frequency-emitting devices and cabling shall be approved by the fire code official. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

**510.4.2.2 Technical criteria.** The fire code official shall maintain a document providing the specific technical information and requirements for the in-building emergency responder communications enhancement system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.

**510.4.2.3 Standby power.** In-building emergency responder communications enhancement systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the in-building emergency responder communications enhancement system at 100-percent system capacity for a duration of not less than 12 hours.

**510.4.2.4 Signal booster requirements.** If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association NEMA Type 4 cabinet, IP66-type waterproof cabinet or equivalent.

EXCEPTION: Listed battery systems that are contained in integrated battery cabinets.

2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet, IP65-type waterproof cabinet or equivalent.

EXCEPTION: Listed battery systems that are contained in integrated battery cabinets.

3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.

4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.
  5. Active RF-emitting devices used for in-building emergency responder communications enhancement systems shall have built-in oscillation detection and control circuitry to reduce gain and maintain operation. When a signal booster detects oscillation, a supervisory signal shall be transmitted. In the event of uncorrectable oscillation, the system shall be permitted to shut down.
  6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any in-building emergency responder communications enhancement network shall be coordinated and approved by the fire code official and the frequency license holder(s).
- 510.4.2.5 System monitoring.** The in-building emergency responder communications enhancement system shall be monitored by a listed fire alarm control unit, or where approved by the fire code official, shall sound an audible signal at a constantly attended on-site location. Automatic supervisory signals shall include the following:
1. Loss of normal AC power supply.
  2. System battery charger(s) failure.
  3. Signal source malfunction.
  4. Failure of active RF-emitting device(s).
  5. Low-battery capacity at 70 percent of the 12-hour operating capacity has been depleted.
  6. Failure of critical system components.
  7. The communications link between the fire alarm system and the in-building emergency responder communications enhancement system.
  8. Oscillation of active RF-emitting device(s).

**510.4.2.5.1 Single supervisory input.** Where approved, a single supervisory input to the fire alarm system to monitor all system supervisory signals shall be permitted.

**510.4.2.6 Additional frequencies and change of frequencies.** The in-building emergency responder communications enhancement system shall be capable of modification or expansion in the event frequency changes are required by the FCC or other frequency licensing authorities, or additional frequencies are made available by the FCC or other frequency licensing authorities.

**510.4.2.7 Design documents.** The fire code official shall have the authority to require “as-built” design documents and specifications for in-building emergency responder communications enhancement systems. The documents shall be in a format acceptable to the fire code official.

~~**510.4.2.8 Radio communication antenna density.** Systems shall be engineered to minimize the near-far effect. In building, emergency responder communication enhancement system.~~

~~Exception:— Systems where all portable devices within the same band use active power control features.~~

~~**510.4.2.8 Near-far effect.** Where a signal booster is required by the RF system designer, the dynamic range of the in-building emergency responder communications enhancement system shall be designed to minimize the effects of strong signal automatic gain control on weak signal uplink performance.~~

~~**510.4.2.8 Noise interference.** Where a signal booster is used, signal booster type(s) and the uplink signal and noise levels shall be coordinated with and approved by all frequency license holder(s) that may be adversely impacted by any transmitted noise resulting from the in-building emergency responder communications enhancement system. Systems shall be in compliance with all frequency licensing authority requirements.~~

**510.5 Installation requirements.** The installation of the in-building emergency responder communications enhancement system shall be in accordance with ~~NFPA 1221~~ NFPA 1225 and Sections 510.5.1 through 510.5.5. 510.5.7.

~~**510.5.1 Mounting of the donor antenna(s).** To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the highest possible position on the building or where approved by the fire code official, mounted on a movable sled with a clearly visible sign stating “MOVEMENT OR REPOSITIONING OF THIS ANTENNA IS PROHIBITED WITHOUT APPROVAL FROM THE FIRE CODE OFFICIAL.” shall be posted. The antenna installation shall be in accordance with the applicable requirements in the International Building Code for weather protection of the building envelope.~~

**510.5.2 Approval prior to installation.** Communications enhancement systems capable of operating on frequencies licensed to any public safety agency by the FCC or other frequency licensing authority shall not be installed without prior coordination and approval of the fire code official and frequency license holder.

**510.5.2.1 Active RF-emitting devices.** Active RF-emitting devices shall meet the following requirements in addition to any other requirements determined by the fire code official or the frequency license holder(s):

1. Active RF-emitting devices that have a transmitted power output sufficient to require certification of the frequency licensing authority shall have the certification of the radio frequency licensing authority prior to installation.
2. All active RF-emitting devices shall be simultaneously compatible for their intended use, as required by the frequency licensing authority, the frequency license holder(s) and the fire code official, at the time of installation.
3. Written authorization shall be obtained from the frequency license holder(s) prior to the initial activation of any RF- emitting devices required to be certified by the frequency licensing authority.

**510.5.3 Minimum qualifications of personnel.** The minimum qualifications of the system designer and lead ~~installation~~ acceptance test personnel shall include both of the following:

1. A valid FCC-issued general radio telephone operators license.
  2. Certification of in-building system training issued by an approved organization or approved school, or a certificate issued by the manufacturer of the equipment being installed.
- These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the fire code official is provided.

~~**510.5.4 Acceptance test procedure.** Where an in-building emergency responder communications enhancement system is required, and upon completion of installation, the building owner shall have the radio system tested to verify that two-way cover- age on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows or by a method approved by the fire code official:~~

- ~~1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.~~
- ~~2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system or equipment approved by the fire code official.~~
- ~~3. Failure of more than one test area shall result in failure of the test.~~
- ~~4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.~~
- ~~5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.~~
- ~~6. 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 during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.~~
- ~~7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.~~
- ~~8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.~~

**510.5.5 FCC compliance.** The in-building emergency responder communications enhancement system installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.

**510.5.6 Wiring.** The backbone, antenna distribution, radiating, or any fiber optic cables shall be rated as plenum cables. The backbone cables shall be connected to the antenna distribution, radiating, or copper cables using hybrid coupler devices of a value determined by the overall design. Backbone cables shall be routed through an enclosure that matches the building's required fire-resistance rating for shafts or interior exit stairways. The connection between the backbone cable and the antenna cables shall be made within an enclosure that matches the building's fire-resistance rating for shafts or interior exit stairways, and passage of the antenna distribution cable in and out of the enclosure shall be protected as a penetration per the International Building Code.

~~**510.5.7 Identification signs.** Emergency responder enhancement systems shall be identified by an approved sign located on or near the fire alarm control panel or other approved location stating "This building is equipped with an Emergency Responder Enhancement Coverage System. Control Equipment located in ..... or as approved by the Fire Code Official." A sign stating "Emergency Responder Enhancement Coverage System Equipment" shall be placed on or adjacent to the door of the room containing the main system components.~~

**510.6 Maintenance.** The in-building emergency responder communications enhancement system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.4.

~~**510.6.1 Testing and proof of compliance.** The owner of the building or owner's authorized agent shall have the in-building emergency responder communications enhancement system inspected and tested annually or where structural changes occur, including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:~~

~~1. In building coverage test as described in Section 510.5.4.~~

~~2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.~~

~~3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1 hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1 hour periods until the integrity of the battery can be determined.~~

~~4. All active components shall be checked to verify operation within the manufacturer's specifications.~~

~~At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.4, shall be submitted to the fire code official.~~

~~510.6.1.1 The owner of the building or owner's authorized agent shall have the in-building, emergency responder communication enhancement system inspected and tested annually or where structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following items 1 through 7:~~

~~1. In building coverage test as required by the fire code official as described in Section 510.5.4 or 510.6.1.1.~~

~~EXCEPTION: Group R Occupancy annual testing is not required within dwelling units.~~

~~2. Signal boosters shall be tested to verify that the gain/output level is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.~~

~~3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1 hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1 hour periods until the integrity of the battery can be determined.~~

~~4. All other active components shall be checked to verify operation within the manufacturers specification.~~

~~5. If a fire alarm system is present in the building, a test shall be conducted to verify that the fire alarm system is properly supervising the emergency responder communication enhancement system as required in Section 510.4.2.5. The test is performed by simulating alarms to the fire alarm control panel. The certifications in Section 510.5.2 are sufficient for the personnel performing this testing.~~

~~6. At the conclusion of testing, a record of the inspection and maintenance along with an updated grid diagram of each floor showing tested strengths in each grid square and each critical area shall be added to the documentation maintained on the premises in accordance with Section 510.5.3.~~

~~7. At the conclusion of the testing, a report, which shall verify compliance with Section 510.6.1, shall be submitted to the fire code official.~~

**510.6.1.1 Alternative in-building coverage test.** When the comprehensive test documentation required by Section 510.5.3 is available, or the most recent full five-year test results are available if the system is older than six years, the in-building coverage test required by the fire code official in Section 510.6.1(1), may be conducted as follows:

1. Functional talk-back testing shall be conducted using two calibrated portable radios of the latest brand and model used by the agency's radio communications system or other equipment approved by the fire code official. Testing shall use digital audible quality (DAQ) metrics, where a passing result is a DAQ of 3 or higher. Communications between handsets in the following locations shall be tested:

Between the fire command center or fire alarm control panel and a location outside the building and between the fire alarm control panel and each landing in each stairwell.

2. Coverage testing of signal strength shall be conducted using a calibrated spectrum analyzer for:

a. Three grid areas per floor. The three grid areas to be tested on each floor are the three grid areas with poorest performance in the acceptance test or the most recent annual test, whichever is more recent;

b. Each of the critical areas identified in acceptance test documentation required by Section 510.5.3, or as modified by the fire code official; and

c. One grid square per serving antenna.

3. The test area boundaries shall not deviate from the areas established at the time of the acceptance test, or as modified by the fire code official. The building shall be considered to have acceptable emergency responder communication coverage when the required signal strength requirements in Sections 510.4.1.1 and 510.4.1.2 are located in 95 percent of all areas on each floor of the building and 99 percent in critical areas, and any nonfunctional serving antenna are repaired to function within normal ranges. If the documentation of the acceptance test or most recent previous annual test results are not available or acceptable to the fire code official, the radio coverage verification testing described in Section 510.5.3 shall be conducted.

**510.6.2 Additional frequencies.** The building owner shall modify or expand the in-building emergency responder communications enhancement system at their expense in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority. Prior approval of an in-building emergency responder communications enhancement system on previous frequencies does not exempt this section.

**510.6.3 Nonpublic safety system.** Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the in-building emergency responder communications enhancement system, the nonpublic safety amplification system shall be corrected or removed.

~~**510.6.4 Field testing.** Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage or to disable a system adversely impacting the emergency responder communication enhancement system in the region.~~

**5. Briefly explain your proposed amendment, including the purpose, benefits and problems addressed.** Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

**SECTION 510** Recommend matching title from model code into WAC.

**510.1 Emergency responder communications enhancement systems in new buildings** – state amendment is not needed the new model code has added #4 exception will need to review.

**510.2 Emergency responder communications enhancement system in existing buildings** - Recommend deleting WA amendment it is now in the model code.

**510.3 Permits** - New language for 2024 model code recommend to keep.

- 510.3.1 Permit required.** - Recommend deleting the amendment language now is in the model code with the addition of the last sentence.
- 510.3.2 Operational permit.** - Recommend to review
- 510.4 Technical requirements.** - Recommend deleting amendment, language in model code.
- 510.4.1 Emergency responder communications enhancement system signal strength.** - Recommend deleting amendment, language in model code.
- 510.4.1.1 Minimum signal strength into the building.** - Need to review existing amendment with proposed changes in model code.
- 510.4.1.2 Minimum signal strength out of the building.** - Review changes to out of the building.
- 510.4.1.3 System performance.** – Recommend to review
- 510.4.2 System design.** - Recommend deleting amendment, language in model code
- 510.4.2.1 Amplification systems and components.** - Recommend deleting amendment, language in model code
- 510.4.2.2 Technical criteria.** - Recommend deleting amendment, language in model code
- 510.4.2.3 Standby power.** - Recommend deleting amendment, language in model code
- 510.4.2.4 Signal booster requirements.** - Recommend maintaining parts of state amendment and review for changes in the model code
- 510.4.2.5 System monitoring.** - Recommend maintaining parts of state amendment and review for changes in the model code
- 510.4.2.5.1 Single supervisory input.** - Recommend for review
- 510.4.2.6 Additional frequencies and change of frequencies.** - Recommend deleting amendment, language in model code
- 510.4.2.7 Design documents.** - Recommend deleting amendment, language in model code
- 510.4.2.8 Radio communication antenna density.** - This section is broken into two sections for the 2024 code (510.4.2.8 and 510.4.2.8and the WA amendment is no longer needed.
- 510.4.2.8 Near-far effect.** - Recommend for review
- 510.4.2.8 Noise interference.** - Recommend for review
- 510.5 Installation requirements.** - Recommend modifying existing amendment
- 510.5.1 Mounting of the donor antenna(s).** - Recommend to keep the existing amendment
- 510.5.2.1 Active RF-emitting devices.** - Recommend to Review
- 510.5.3 Minimum qualifications of personnel.** - Recommend to review if this last sentence is needed or not
- 510.5.4 Acceptance test procedure.** - Recommend to keep the state amendment
- 510.5.5 FCC compliance.** - Recommend delete amendment, language in model code.
- 510.5.6 Wiring.** - Recommend review of current amendment with NFPA 1225 for any changes
- 510.5.7 Identification signs.** - Recommend to keep the amendment
- 510.6 Maintenance.** - recommend to delete the state amendment language is in the model code
- 510.6.1 Testing and proof of compliance.** - Keep current state amendment
- 510.6.1.1 Alternative in-building coverage test.** - Keep current state amendment
- 510.6.2 Additional frequencies.** - Delete amendment, language in model code
- 510.6.3 Nonpublic safety system.** - Delete amendment, language in model code
- 510.6.4 Field testing.** - Keep current state amendment

**6. Specify what criteria this proposal meets.** You may select more than one.

- The amendment is needed to address a critical life/safety need.
- The amendment clarifies the intent or application of the code.



- The amendment is needed to address a specific state policy or statute.
- The amendment is needed for consistency with state or federal regulations.
- The amendment is needed to address a unique character of the state.
- The amendment corrects errors and omissions.

7. **Is there an economic impact:**  Yes  No

If no, state reason: The code change proposal will not increase or decrease the cost of construction  
**F34-21 510.1** - This proposal provides clarification of intent and sets a minimum threshold for the installation of an ERCES.

**F36-21 510.3** - The primary benefit of both a construction and operational permit is documentation that a system has been installed and continues to operate. Renewable permits and written authorization by the Frequency License Holder are required for all ERCES and a renewable permit provides for this requirement.

**F37-21 510-4** - This proposal provides clarity and aligns the terms uplink and downlink which are standard industry terms. Additionally, it clarifies the signals to be measured and the methods associated with measuring them.

**F42-21 510.5** - This proposal clarifies the original intent of the section as it relates to near-far conditions and ensures the frequency license holder is involved in the process.

**F47-21 510.5.6** - The code change proposal will decrease the cost of construction - Pathway survivability is already required through a reference to NFPA 1221. However, the reference is unclear as to when and what type of pathway survivability is required. This proposal provides clarification as to when and what type of protection is needed where required.

If yes, provide economic impact, costs and benefits as noted below in items a – f.

- a. **Life Cycle Cost.** Use the OFM Life Cycle Cost [Analysis tool](#) to estimate the life cycle cost of the proposal using one or more typical examples. Reference these [Instructions](#); use these [Inputs](#). Webinars on the tool can be found [Here](#) and [Here](#)). If the tool is used, submit a copy of the excel file with your proposal submission. If preferred, you may submit an alternate life cycle cost analysis.
- b. **Construction Cost.** Provide your best estimate of the construction cost (or cost savings) of your code change proposal.

\$Click here to enter text./square foot

(For residential projects, also provide \$Click here to enter text./ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

- c. **Code Enforcement.** List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:
- d. **Small Business Impact.** Describe economic impacts to small businesses:
- e. **Housing Affordability.** Describe economic impacts on housing affordability:

- f. ***Other.*** Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Please send your completed proposal to: [sbcc@des.wa.gov](mailto:sbcc@des.wa.gov)

**All questions must be answered to be considered complete. Incomplete proposals will not be accepted.**