CITY OF PORT COQUITLAM

Emergency Services Radio Bylaw

Bylaw No. 4210

The Council of the Corporation of the City of Port Coquitlam enacts as follows:

1. CITATION

1.1 This Bylaw is cited as “Emergency Services Radio Bylaw, 2020, No. 4210”.

2. REPEAL

2.1 City of Port Coquitlam Public Safety Radio Building Amplification System Bylaw No. 3738, as amended, is repealed.

3. INTERPRETATION

3.1 In this bylaw, unless otherwise indicated:

“**Adequate Radio Coverage**” has the meaning as described in Section 4;

"**Amplification System**" means the internal booster radio support and amplification system that increases and supports the radio frequencies used by E-Comm;

“**Building Inspector**” means any person appointed by the City to be a Building Inspector, or that person’s authorized designate;

"**City**" means the City of Port Coquitlam;

“**Dispatch Center**” means the dispatch service used by the Fire Department;

"**E-Comm**" means Emergency Communications for British Columbia Incorporated and all the features and functions of trunked radio telecommunications systems, including microwave and VHF/UHF radio systems, provided by E-Comm to the Fire Department, law enforcement and other emergency services; for the City of Port Coquitlam, the designated public safety communications service provider is “E-Comm” and its services encompass all the features and functions of its radio communications systems, including microwave radio systems, provided to fire services, law enforcement, British Columbia Emergency Health Services (BCEHS) and other emergency services;

"**Fire Chief**" means the person appointed by the City to be the head of the Fire Department, and references in this Bylaw to the Fire Chief include the Deputy Fire Chief and Assistant Fire Chief acting on the Fire Chief’s behalf or during the absence of the Fire Chief;

“**Fire Department**” means the City of Port Coquitlam Fire and Emergency Services;

“Industry Canada” (IC) means a federal government department mandated to increase global trade and build a fair competitive marketplace through support for

scientific research, setting telecommunications policy and other activities' and oversees ISED.

"Innovation, Science & Economic Development Canada (ISED)" means federal regulators for telecommunications in Canada.

"**Owner**" means an owner of a building or structure regulated by this Bylaw, including co-owners;

"**NFPA**" means National Fire Protection Association;

"**Permit**" means authorization in writing by the Building Inspector to perform construction or demolition of a building or structure, or to permit occupancy of a building or structure, all as regulated by the City's current Building and Plumbing Bylaw, as amended;

"**Shadowed Area**" means an area that suffers attenuation or obstruction of radio signals to or from the area as a result of the interposition of all or any part of a building or structure in the radio signal path (line of sight) between the area and the transmitting/receiving site of E-Comm;

"**Test Operator"** means an individual or company with experience in testing radio communications signals and whose credentials are deemed satisfactory to the Fire Chief.

3.2 Words in the singular include the plural, and gender specific terms include all genders and corporations.

3.3 Headings in this Bylaw are for convenience only and must not be construed as defining or in any way limiting the scope or intent of this Bylaw.

3.4 Unless otherwise provided in this Bylaw, words and phrases used herein have the same meanings as in the *Community Charter, SBC 2003*, *Local Government Act, RSBC 2015*, and *Interpretation Act, RSBC 1996*.

3.5 A reference in this Bylaw to a statute refers to a statute of the Province of British Columbia, and a reference to any statute, regulation, or bylaw refers to that enactment, as amended or replaced from time to time.

3.6 A decision by a court that any part of this Bylaw is illegal, void, or unenforceable severs that part from this Bylaw, and does not affect the validity of the remainder of this Bylaw.

4. REQUIREMENTS TO PROVIDE A RADIO COMMUNICATIONS SUPPORT SYSTEM

4.1 Except as otherwise provided, no person shall erect, construct, change the use of, or renovate any building or structure or any part thereof, or cause the same to be done, which degrades the radio coverage provided by the City's public safety communications service provider, as experienced by its users, including, but not limited to fire services and law enforcement personnel. For the purposes of this section, adequate radio coverage shall include all of the following:

4.1.1 System access and "Delivered Audio Quality" of 3.4 or better (speech understandable with repetition only rarely, some noise or distortion may be present) for communication between a portable (handheld) radio with simple flexible whip antenna ("rubber ducky") and the public safety communications service provider radio communication sites;

4.1.2 Within the building, for a minimum of 90% of the area of each floor of the building, including underground areas such as for parking;

4.1.3 Within the building, for 100% of fire command centres, stairwells, protect-in-place areas, lobby refuge areas, equipment rooms and high-hazard areas;

4.1.4 In areas that are in the Shadow Area of the building, in 90% of all areas where "Delivered Audio Quality" of 3.4 could be achieved before the erection, construction or modification of the building or structure;

4.1.5 As an aid to system design, "Delivered Audio Quality" of 3.4 has been measured by NTIA (U.S. Department of Commerce, National Telecommunications and Information Administration) to be approximately equivalent to 22 dBs (22 dB SINAD) for analogue signals modulated with a 1 kHz tone at 1.5 kHz deviation, and to 2% BER (Bit Error Rate) for P25 digital signals. It may also be approximately equivalent to a received signal level of -95 dBm, in the absence of other signals that may affect the receiver. Good design should provide a margin of not less than 10 dB to allow for uncontrolled variables. Based on the foregoing, the design target for indoor coverage should be -85 dBm;

4.1.6 The radio frequency range to be supported shall be any frequencies used by the public safety communications service provider's network. If signal amplifiers are used, they shall include filters that will protect the amplifiers from overload and the system from interference by out-of-band signals;

4.1.7 In the event that active amplification is required to meet the foregoing communication quality requirements in the building including Shadowed Area of the building, coordination with the public safety communications service provider is required to ensure that its outdoor radio communication performance is not degraded. If there is a trade-off to be made between maintaining the public safety communications service provider's outdoor radio communication performance and restoration of signal strength in the building and Shadowed Area, the trade-off decision shall be made by the public safety communications service provider and communicated to the Fire Chief by the building owner;

4.1.8 An active system shall not degrade the wide area radio network in any way. For any amplifier in the uplink path, the transmitted uplink noise as received at the antenna of the donor E-Comm radio site shall not exceed -130 dBm;

4.1.9 For any amplifier connected to a donor antenna, Amplifier gain vs. Isolation must comply with NFPA 1221-19 Standard, 9.6.9. *"If a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to a minimum of 20 dB above system gain."*

4.2 All active amplification systems components must meet Industry Canada licensing requirements.

5. AMPLIFICATION SYSTEMS ALLOWED

5.1 Where a building or structure requires an Amplification System to achieve adequate radio communication coverage, such system shall include any of the following that are sufficient to achieve the required coverage:

5.1.1 Passive antenna systems or radiating cable systems;

5.1.2 Distributed antenna systems with uni-directional or bi-directional amplifiers as needed;

5.1.3 Voting receiver systems;

5.1.4 Any other system acceptable to the Fire Chief, as signified in writing on a case-by-case basis.

5.2 If any part of the installed Amplification System contains an electrically-powered component, the system shall:

5.2.1 Be equipped to operate on an independent "Uninterruptible Power Supply" (UPS), using a battery and/or generator system, for a period of at least four hours without external power or maintenance.

5.2.2 Automatically charge the UPS batteries in the presence of external power. The UPS shall provide a monitored alarm signal to indicate failure of primary power, failure of the UPS system power output, and/or discharge of the batteries. Silencing of this alarm shall be the responsibility of the person maintaining the equipment. Port Coquitlam Fire and Emergency Services shall be notified of any failure, either immediately that the failure is detected, but not later than two (2) hours after the initial failure occurred.

5.2.3 Detect critical alarms by the equipment regarding battery condition and amplifier performance shall be reported immediately.

5.2.4 Be protected by National Electrical Manufacturers Association (NEMA) type 4 or higher enclosures for all amplifiers and electronics.

5.2.5 Provide a system summary alarm, consisting of a relay contact closure or equivalent, shall be provided to the building fire panel via a hard-wired connection.

5.2.6 Ensure all active systems are licensed by the federal regulator, Innovation, Science & Economic Development Canada (ISED), and shall comply with the applicable Standard Radio Systems Plan (SRSP) and Radio Standard Specification (RSS). Any license required shall be renewed annually by the building owner and the cost of the licensing borne solely by the building owner.

5.2.7 Be selected from the ISED Radio Equipment List as described at: https://www.ic.gc.ca/eic/site/ceb-bhst.nsf/eng/h_tt00020.html

6. PROCEDURES TO VERIFY AND MAINTAIN COMPLIANCE

6.1 Tests and measurements to verify and maintain compliance shall be made at the sole expense of the building owner. The procedures used shall be developed by the owner, subject to acceptance by the Fire Chief, and in compliance with the following guidelines:

6.1.1 Acceptance tests and measurements shall be performed after completion of installation of the Amplification System. Tests shall be performed using radio frequencies assigned by the public safety communications service provider, after proper coordination with an authorized representative of that system and with the Fire Chief and the OIC of Police for the City of Port Coquitlam.

6.1.2 If queuing occurs on the radio system while testing is underway, testing shall be terminated immediately and resumed only when traffic levels on the system drop to the level where queuing will no longer occur.

6.1.3 Where the Shadowed Area, or the floor plate area of a building, is greater than 4,500 m^2, the area shall be divided into a uniform grid of not more than 15 metres on a side, or if the floor area is smaller than 4,500 m^2 it shall be divided into a uniform grid of approximately 20 equal areas, to a minimum of 9 m^2, and measurements shall be taken in each grid area. The size of the grids shall also be reduced, or the number of grids increased, upon recommendation of the Fire Chief or inspector in areas where special construction or other obstruction may significantly affect communications. Tests shall also be performed in fire command centres, stairwells, protect-in place areas, lobby refuge areas, equipment rooms, and high-hazard areas.

6.1.4 Tests shall first be made using a portable (handheld) radio of the type used by emergency service personnel, carried at hip level (with external speaker/mic) and using a simple "rubber ducky" antenna, and shall be deemed satisfactory if "Delivered Audio Quality" of 3.4 or better (speech understandable with repetition only rarely, some noise or distortion may be present) can be achieved for a five-second test transmission in each direction. If system access is not reliable, or if "Delivered Audio Quality" of 3.4 for five seconds cannot be achieved at any location, the test operator may move a maximum of 1.5 metres in any direction inside of the grid and repeat the test. If system access continues to be unreliable, or if "Delivered Audio Quality" of 3.4 still cannot be achieved, or if there is any doubt about whether it can be achieved, a failure shall be recorded for that location.

6.1.5 For all tests, a pre-defined “Harvard” sentence should be used, such that the listeners are not aware of the sentence in advance on each test. A different recorded sentence should be used at each location.

6.1.6 A maximum of two (2) non-adjacent grid areas on a floor or in a shadow will be allowed to fail the test. In the event that three (3) or more areas on a floor or in a shadow fail the test, the floor or Shadowed Area may be divided into 40 approximately equal areas to a minimum of four (4) m^2, and the tests repeated. In such event, a maximum of four (4) non-adjacent grid areas will be allowed to fail the test. If the Amplification System fails the 40-area test, the building owner shall have the system altered to meet the 90% coverage requirement; otherwise the Amplification System will not be accepted.

6.1.7 If the Amplification System fails to provide acceptable communication in any of the fire command centre, any portion of a stairwell, protect-in-place areas, lobby refuge areas, equipment rooms, or high-hazard areas, the building owner shall have the system altered to meet the 100% coverage requirement for these areas, otherwise the Amplification System will not be accepted.

6.1.8 Backup batteries and power supplies shall be tested under full load by generating communication traffic automatically for a duration of at least one (1) hour. If within the one-hour period, the battery shows no symptom of failure or impending failure, the test shall be continued for additional one-hour periods to determine the integrity of the battery. The battery shall not fail within a four-hour continuous test period.

6.1.9 The gain values of all amplifiers shall be measured, using a service monitor that has been calibrated by a certified laboratory within the past 12 months, and the results shall be kept on file by the building owner for future verification and monitoring of performance. The gain records file must have multiple back-ups and be stored in more than one location.

6.2 ANNUAL TESTS

6.2.1 At least annually, the building owner shall test all active components of the Amplification System, including, but not limited to all amplifiers, power supplies and back-up batteries, and shall keep a record of such tests as part of the Fire Safety Plan for inspection by the Fire Chief or other inspector designated by the City. Amplifier gain shall be adjusted if necessary to re-establish the gain recorded upon acceptance testing, and batteries and power supplies shall be tested under load for a period of at least one (1) hour to verify that they will function properly during a power outage.

6.2.2 Amplifier testing shall include measuring isolation and amplifier uplink noise, and confirming that the system conforms to Sections 4.1.6 and 4.1.7.

6.2.3 Additional tests or inspection of records may be conducted from time to time by the Fire Department at the discretion of the Fire Chief, after giving reasonable notice to the building owner. If communications within the building or within the Shadowed Area appear to have degraded, or if the tests show unacceptable communications performance, or if the system is causing interference to or degrading the wide area radio network in any way, the owner of the building or structure is required to remedy the problem and restore the Amplification System in a manner consistent with the original acceptance criteria, unless the owner can demonstrate conclusively that the degradation is solely the result of external changes not under their control.

6.3 QUALIFICATIONS OF TESTING PERSONNEL AND TEST (MEASUREMENT) EQUIPMENT

6.3.1 Tests shall be performed by or under the direct supervision of a professional engineer registered in the Province of British Columbia and qualified in radio communications. Test reports shall bear the seal of the engineer.

6.3.2 Portable radios used shall be of a size and type as designated as acceptable by Port Coquitlam Fire and Emergency Services, or such replacement radio as may be in use by Port Coquitlam Fire and Emergency Services at the time, accepted by the public safety communications service provider and programmed to operate on a P25 radio tuned to a P25 test channel. SINAD, BER, and signal strength measurements shall be made using appropriate instrumentation acceptable to the public safety communications service provider. Radios and measurement equipment shall have been tested for conformance to design specifications within twelve months prior to the conduct of Amplification System acceptance tests or re-tests.

7. EXEMPTIONS

7.1 This Bylaw shall not apply to:

7.1.1 Any single-family detached or semi-detached residence;

7.1.2 Any building or structure that complies with all of the following:

(a) is constructed entirely of wood frame;

(b) does not have any metal cladding;

(c) does not have any Low-E reflective glass;

(d) does not have any portion of the building or structure with a floor level that is partially or wholly underground, including basements, cellars and crawlspaces;

(e) the area of all the floors of the building or structure is less than 5000 square metres, as measured to the lesser of the outside edge of the exterior walls or sheathing; and

(f) is less than 12 metres in height, as measured from the lowest ground elevation of the building or structure to the highest point of the building or structure.

7.1.3 Any building or structure that has been granted an exemption in writing by the Fire Chief or Building Official, where the Fire Chief or Building Official considers that the building or structure should be exempt from this Bylaw, having consideration for the operational needs of the City, the need for or quality of radio coverage in the building or structure, or any other factor the Building Official or Fire Chief considers appropriate.

8. PERMIT CONDITIONS

8.1 No Permit shall be issued for any building or structure until the requirements of this Bylaw have been met to the satisfaction of the Building Inspector and the Fire Chief.

9. RIGHT OF ENTRY

9.1 Every Owner or occupant of a building shall, at all reasonable times, permit the Building Inspector, the Fire Chief, or their authorized designate, to enter into and inspect any building or structure to ascertain whether the regulations and provisions of this Bylaw are being adhered to.

9.2 Any person who refuses entry to the Building Inspector, the Fire Chief, or their authorized designate, shall be in violation of this Bylaw and shall be subject to penalties as outlined in Bylaw Notice Enforcement Bylaw, 2012, No. 3814, as amended.

10. DEEMED NUISANCE

10.1 The construction or erection of a building or structure which interferes with the City's fire services, law enforcement and other emergency-related telecommunications networks shall constitute a nuisance, because it threatens the health, safety and welfare of the residents and visitors to the City. In addition to any other remedies or enforcement procedures provided herein, the City may seek an injunction to restrain such a nuisance.

11. COST RECOVERY

11.1 Wherever this Bylaw imposes a requirement on a person that something be done, Council may, by resolution, direct that person to take such action. Council will provide written notice to the person of its resolution and the actions required of them. If, after receiving written notice, the person has not taken the required action within the time permitted in the resolution, City staff may:

11.1.1 Fulfill the requirement at the expense of the person; and

11.1.2 Recover the costs incurred from that person as a debt.

11.2 Any debt resulting from section 11.1 may be recovered pursuant to section 258 of the Community Charter.

12. OFFENCE AND PENALTIES

Notwithstanding the offence and penalties as provided under the *Community Charter* or *Local Government Act*, the following will apply:

1. a violation of any of the provisions identified in this Bylaw will result in liability for penalties and late payment amounts established in the City's Bylaw Notice Enforcement Bylaw.

b) a Person who:
   (i) contravenes, violates or fails to comply with any provision of this Bylaw;
   (ii) suffers or allows any act or thing to be done in contravention or violation of this Bylaw; or
   (iii) fails or neglects to do anything required to be done under this Bylaw; is deemed to have committed an infraction of, or an offence against, this Bylaw; and is liable on summary conviction to a fine of not more than $50,000.00; and

c) each day such infraction is caused, or allowed to continue, constitutes a separate offence.

13. NO DUTY OF CARE

Neither failure to enforce this Bylaw, nor any error, omission, or other neglect in relation to the enforcement of this Bylaw, shall be interpreted as giving rise to a cause of action in favour of any person."

14. SEVERABILITY

A decision by a court that any part of this Bylaw is illegal, void, or unenforceable severs that part from this Bylaw, and does not affect the validity of the remainder of this Bylaw.

READ A FIRST TIME this	15 day of	December, 2020
READ A SECOND TIME this	15 day of	December, 2020
READ A THIRD TIME this	15 day of	December, 2020
ADOPTED this	12 day of	January, 2021

B. WEST	G. JOSEPH
Mayor	Corporate Officer

RECORD OF AMENDMENTS

Amendment Bylaw	Section(s) Amended	Date
4224	Definitions, 9.2, 12, 13 & 14	2021-03-23