THE CORPORATION OF THE TOWNSHIP OF LANGLEY

PUBLIC SAFETY RADIO BUILDING AMPLIFICATION SYSTEM BYLAW 2017 NO. 5319

EXPLANATORY NOTE

Bylaw 2017 No. 5319 requires that certain buildings and alterations, reconstructions and renovations of certain buildings, have radio amplification systems to support the uninterrupted operation of the Township's public safety communications service provider as experienced by its users, including but not limited to fire services and law enforcement personnel.

This Bylaw is enforceable by Bylaw Offence Notices pursuant to the Township of Langley Bylaw Notice Enforcement Bylaw 2008 No. 4703 as amended.

THE CORPORATION OF THE TOWNSHIP OF LANGLEY

PUBLIC SAFETY RADIO BUILDING AMPLIFICATION SYSTEM BYLAW 2017 NO. 5319

WHEREAS it is deemed necessary and desirable that certain buildings have radio support and amplification systems to ensure the Township's fire service, law enforcement and other emergency services radio communications networks provide public safety grade reliability essential to public safety and emergency response;

AND WHEREAS certain buildings constructed of steel, reinforced concrete or reflective glass can cause radio signal penetration losses thereby degrading the quality of communications provided by emergency services radio communications networks;

AND WHEREAS radio support and amplification systems within buildings can overcome the degradation of emergency communications and are vital to public safety, policing and emergency services;

NOW THEREFORE, the Municipal Council of The Corporation of the Township of Langley, in Open Meeting Assembled, ENACTS AS FOLLOWS:

Citation

1. This Bylaw may be cited for all purposes as "Public Safety Radio Building Amplification System Bylaw 2017 No. 5319".

Severability

2. If a portion of this Bylaw is found invalid by a court of competent jurisdiction, it will be severed and the remainder of the Bylaw will remain in effect.

Definitions

3. For the purpose of this Bylaw, the following words have the following meanings:

   (a) "**Amplification System**" means the in-building radio communications support and amplification systems described in Section 4 of this Bylaw;

   (b) "**building**" means any structure used or intended for supporting or sheltering any use or occupancy;

   (c) "**Building Official**" means the person appointed by the Township as the General Manager of Engineering & Community Development or such person's authorized delegate;

   (d) "**E-Comm**" means Emergency Communications for Southwest British Columbia Incorporated and 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;

(e) "**Farm Business**" has the meaning given to it in the *Farm Practices and Protection (Right to Farm) Act*, RSBC 1996, c 131;

(f) "**Farm Operation**" has the meaning given to it in the *Farm Practices and Protection (Right to Farm) Act*, RSBC 1996, c 131;

(g) "**Fire Chief**" means the person appointed by the Township to be in charge of the Protective Services and firefighting personnel of the Township, including a Deputy Fire Chief, Assistant Fire Chief and any other person authorized thereby to act on behalf of the Fire Chief;

(h) "**Final Inspection**" means the permission or authorization in writing by the Building Official to occupy a building;

(i) "**gross floor area**" means the sum of the area of each floor of a building including exterior walls;

(j) "**occupancy**" means the use or intended use of a building or part thereof for the shelter or support of persons, animals or property;

(k) "**owner**" includes the registered owner of an estate in fee simple of land, and as applicable:

i. a tenant for life under a registered life estate;
ii. a registered holder of an agreement for sale;
iii. a holder or occupier of land held in the manner set out in sections 228 and 229 of the Community Charter; and
iv. a lessee with authority to build on the land;

(l) "**Permit**" means authorization in writing by the Building Official to perform construction regulated by Township Building Bylaw, 2008, No. 4642, as amended; and

(m) "**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 the building in the radio signal path between the area and the transmitting/receiving site of the Township's public safety communications service provider; and

(n) "**Township**" means The Corporation of the Township of Langley.

Requirements to Provide a Radio Communications System Support

General

4. Except as otherwise provided, no person shall erect, construct, change the use of or provide an addition of more than 20% to the gross floor area of any building or any part thereof, or cause the same to be done, which fails to support adequate radio coverage provided by the Township's public safety communications service provider (including but not limited to E-Comm and its successors) 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:

(a) System access and "Delivered Audio Quality" (DAQ) 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 and the Township's public safety communications service provider radio communication sites:

i. within the building, for a minimum of 90% of the area of each floor of the building, including underground areas such as for parking; and

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

iii. in areas that are in the Shadowed Area of the building, in 90% of all areas where DAQ 3.4 could be achieved before the erection, construction or modification of the building.

(b) As an aid to system design, DAQ 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. Therefore, the design target for indoor coverage should be -85 dBm.

(c) The radio frequency range to be supported shall be any frequencies used by the Township's 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.

(d) 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 Township's public safety communications service provider is required to ensure that its outdoor radio communication performance is not degraded. Where a decision must be made regarding the maintenance of either the Township's 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 Township's public safety communications service provider and communicated to the Fire Chief by owner of the building.

Amplification Systems Allowed

5. Where a building 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:

   (a) passive antenna systems or radiating cable systems;

   (b) distributed antenna systems with uni-directional or bi-directional amplifiers as needed;

   (c) voting receiver systems; or

   (d) any other system acceptable to the Fire Chief, as signified in writing on a case by case basis.

6. If any part of the installed Amplification System contains an electrically powered component, the system shall 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. All amplifiers and electronics required by the system shall be protected by NEMA type 4 or higher enclosures. The UPS shall automatically charge the 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. The building owner will ensure that the Township of Langley Fire Department is notified of any failure, either immediately that the failure is detected, but not later than (2) hours after the initial failure occurred.

7. The building owner will ensure that critical alarms detected by the equipment regarding battery condition and amplifier performance are reported to the Township of Langley Fire Department immediately.

8. A system summary alarm, consisting of a relay contact closure or equivalent, shall be connected to the fire panel of the building via a hard wired connection.

9. Radio equipment shall only be selected from the ISED Radio Equipment List and all active systems shall be licensed by the federal regulator, Innovation, Science & Economic Development Canada (ISED), and shall comply with the applicable Standard Radio Systems Plan (SRSP). Any license required shall be renewed annually by the building owner and the cost of the licensing borne solely by the building owner.

Procedures to Verify and Maintain Compliance

10. 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 building owner, subject to acceptance by the Fire Chief, and in compliance with the following guidelines:

(a) Acceptance Test Procedure

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 Township's public safety communications service provider, after proper coordination with an authorized representative of that system and with the Fire Chief and the Officer in Charge of Police for the Township of Langley.

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.

(i) 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 m on a side, or if the floor area is smaller than 4,500m^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.

(ii) 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 DAQ 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 DAQ 3.4 for five seconds cannot be achieved at any location, the test operator may move a maximum of 1.5 m in any direction inside of the grid and repeat the test. If system access continues to be unreliable, or if DAQ 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.

(iii) 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.

(iv) A maximum of two (2) non-adjacent grid areas on a floor or in a Shadowed Area will be allowed to fail the test. In the event that three (3) or more areas on a floor or in a Shadowed Area fail the test, the floor or Shadowed Area may be divided into 40 approximately equal areas to a minimum of 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.

(v) 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.

(vi) Backup batteries and power supplies shall be tested under full load by generating communication traffic automatically for a duration of at least one 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.

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.

(b) Annual Tests

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 Township. 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.

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, the owner of the building is required to remedy the problem and restore the Amplification System in a manner consistent with the original acceptance criteria, unless the building owner can demonstrate conclusively that the degradation is solely the result of external changes not under his or her control.

(c) Qualifications of Testing Personnel and Test (Measurement) Equipment

Tests and measurements to be performed pursuant to this Bylaw 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.

Portable radios used shall be of a size and type as designated as acceptable by Township of Langley Fire Department, or such replacement radio as may be in use by Township of Langley Fire Department at the time, accepted by the Township's 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 Fire Chief. 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.

Exemptions

11. Subject to section 12, this Bylaw shall not apply to the following residences or buildings:

    (a) any single-family detached or semi-detached residence;

    (b) any building constructed of wood frame and not metal-clad;

    (c) any building with a gross floor area less than 5,000 square metres;

    (d) any building less than 12 metres in height; or

    (e) any building used for a Farm Business or Farm Operation and conducting normal farm practices which would qualify for protection under the *Farm Practices Protection (Right to Farm) Act*, RSBC 1996, c. 131 (as amended).

12. The exemptions listed in section 11 shall not apply to residences or buildings which have:

    (a) more than 1,000 metres gross floor area below grade; or

    (b) floor space which is more than 10 metres below grade.

Township Reliance

13. The activities undertaken by or on behalf of the Township pursuant to this Bylaw do not constitute in any way a representation, warranty, assurance or statement that:

    (a) the Building Code, this Bylaw, or any other applicable codes, standards or enactments have been complied with, whether or not a Permit or Final Inspection has been undertaken and occupancy of a building has been authorized in writing by the Building Inspector; or

    (b) the Township accepts any responsibility of ensuring compliance by a person with this Bylaw.

14. When a professional engineer, or other person provides certification or other documentation to the Township under this Bylaw confirming that a building has adequate radio communication coverage as required by this Bylaw or otherwise complies with all other health and safety requirements established by applicable enactments as amended from time to time, the Township will rely solely on such certification and documentation as evidence of conformity with these requirements.

Permit and Occupancy Conditions

15. No Permit shall be issued or Final Inspection shall be approved for any building until the requirements of this Bylaw have been met to the satisfaction of the Building Official and the Fire Chief.

Right of Entry

16. Every owner or occupant of a building shall, at all reasonable times, permit the Building Official or the Fire Chief to enter into and inspect any building to ascertain whether the regulations and provisions of this Bylaw are being obeyed and any person who refuses entry shall be in violation of this Bylaw and shall be liable to the penalties hereby imposed.

Deemed Nuisance

17. The construction or erection of a building which interferes with the Township'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 Township of Langley. In addition to any other remedies or enforcement procedures provided herein, the Township may seek an injunction to restrain such a nuisance.

Offences and Penalties

18. Any person who violates a provision of this Bylaw commits an offence under this Bylaw and, in addition to being subject to any remedies or penalties available to the Township under provincial law (including a bylaw notice issued pursuant to the Bylaw Notice Enforcement Bylaw 2008 No.4703), as amended or replaced from time to time) is also subject to prosecution and, upon summary conviction be liable to a penalty of not less than $200 and not more than $5,000 plus the cost of the prosecution, or a term of imprisonment not exceeding thirty (30) days, or both. Where a violation is a continuing one, each day that a violation of the Bylaw occurs, or is allowed to continue, constitutes a separate offence.

READ A FIRST TIME the	23	day of	October	, 2017
READ A SECOND TIME the	23	day of	October	, 2017
READ A THIRD TIME the	23	day of	October	, 2017
RECONSIDERED AND ADOPTED the		day of		, 2017

_____ Mayor _____ Township Clerk