

The Corporation of the District of North Vancouver

Bylaw 8272

A bylaw for the Regulation of Radio Amplification

WHEREAS a need exists for certain buildings and structures to have internal communications infrastructure systems which support the uninterrupted operation of the District's fire services, law enforcement and other emergency services radio communications essential to public safety and emergency response;

AND WHEREAS building design which incorporates multiple levels of underground and/or high-rise occupancy, or construction materials including concrete, low-emissivity glass, metal studs and flooring, metal-coated insulation and other attenuating materials all contribute to the interruption of emergency services communications networks;

AND WHEREAS radio support and amplification systems within buildings or structures can overcome the interruption of emergency communications networks and are vital to the delivery of public safety and emergency services in the District;

NOW THEREFORE the Council of the District of North Vancouver, in open meeting assembled, enacts as follows:

1. INTERPRETATION

Citation

1.1 This bylaw may be cited as "**RADIO AMPLIFICATION BYLAW 8272, 2017**".

Purpose and Application

1.2 It is not contemplated nor intended that this bylaw will provide, nor will this bylaw be interpreted as:

- (a) providing protection to owners, builders, constructors or any other persons from economic loss;
- (b) for ensuring the compliance by any owner, agent of an owner or any employees, builders, constructors or designers retained by an owner, with the requirements of this bylaw;
- (c) providing a warranty to any person of design or workmanship or materials with respect to any building, structure or part thereof for which a permit or occupancy certificate is issued under this bylaw;
- (d) providing a warranty or assurance to any person that construction or installation undertaken pursuant to this bylaw is free from any defects, whether patent or latent.

- 1.3 This bylaw applies to:
- (a) the design, construction and occupancy of new buildings and structures; and
 - (b) the alteration, reconstruction or renovation of existing buildings which add more than 20% in gross floor area to an existing building or structure.
- 1.4 This bylaw does not apply to:
- (a) any single and two family dwelling;
 - (b) any building or structure constructed of wood frame and without metal cladding;
 - (c) any building less than 5,000 square metres; or
 - (d) any building or structure less than 12 metres in height to the top of the roof.
- 1.5 The owner of any building or structure referred to in section 1.3 above which is constructed using reinforced concrete or structural steel, metal cladding, studs and/or flooring, reflective or low-emissivity glass, or other attenuating materials, and which:
- (a) has a gross floor area of more than 5,000 square metres;
 - (b) is over 12 metres in height to the top of the roof;
 - (c) has more than 1,000 metres of basement floor space; or
 - (d) has a basement more than 10 metres below the lowest street level of the building

must install and maintain radio amplification systems which will function with the area-wide public safety communications service provider to support uninterrupted radio network communications for public safety and emergency responders within the District.

Definitions

- 1.6 In the absence of specific definition in section 1.7, the words used in this bylaw have the meaning, if any, given to them by definition in the *Community Charter*, S.B.C. 2003 c. 26, as amended or replaced.

- 1.7 In this Bylaw, unless the context otherwise requires:

“agent of an owner” includes a person, firm or corporation representing the owner by designation or contract and includes a hired tradesman or contractor for the owner;

“building” means a structure or portion thereof, which is used or intended to be used for supporting or sheltering any use or occupancy;

“Building Code” means the current edition of the British Columbia Building Code as adopted by the Minister responsible under provincial legislation, as amended, re-enacted or repealed and replaced from time to time;

“building official” means the Chief Building Official and the building inspectors, plan checkers, plumbing inspectors, mechanical inspectors and electrical inspectors designated or appointed by the District;

“Chief Building Official” means the person designated or appointed to that position by the District and any person named by the Council to act in place of the Chief Building Official;

“construct” or “construction” includes build, erect, install, repair, alter, add, enlarge, move, locate, relocate, reconstruct, with respect to a building or structure;

“Council” means the elected council of the District;

“District” means the Corporation of the District of North Vancouver;

“E-Comm” means Emergency Communications for Southwest British Columbia Incorporated and all the features and functions of the trunked public safety radio telecommunications systems, including microwave and VHF/UHF radio systems, provided by E-Comm to fire services, law enforcement and other emergency services;

“Fire Chief” means the person appointed to that position by the District and any person named by the Council to act in place of the Fire Chief;

“occupancy permit” means an occupancy permit issued by the District pursuant to the Construction Bylaw 8271, 2017;

“owner” means the person who is the owner as defined in the Building Code or an agent of that person;

“permit” means a permit issued to authorize construction regulated by the Construction Bylaw 8271, 2017, including a building permit, electrical permit, mechanical permit or occupancy permit as those terms are defined in the Construction Bylaw 8271, 2017.

“shadowed area” means an area that is subject to attenuation or obstruction of radio signals to or from the areas as a result of the interposition of all or any part of the building or structure in the radio signal path (line of sight) between the area and the transmitting/receiving site of the area-wide public safety communications service provider.

2. GENERAL PROHIBITIONS

Adequate Radio Coverage

- 2.1 Except as otherwise provided, no person shall erect, construct, change the use of or provide an addition of more than 20% in square footage to any building or structure or any part thereof, or cause the same to be done, which fails to support adequate radio coverage for the area-wide public safety communications service provider, including but not limited to fire services and law enforcement personnel.

- 2.2 For the purpose of section 2.1, "adequate radio coverage" means system access and "Delivered Audio Quality" (DAQ) of 3.4 or better (speech understandable with repetition rarely, some noise or distortion may be present) for communication between a portable (handheld) radio using a simple flexible whip antenna and both the area-wide public safety communications service provider and the District radio communications network(s) transmitting/receiving sites:
- (a) within the building, for a minimum of 90% of the area of each floor of the building, including underground areas such as for parking;
 - (b) within the building, for 100% of fire command centres, stairwells, protect-in-place areas, lobby refuge areas, equipment rooms and high-hazard areas; and
 - (c) in areas that are in the Shadow 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 or structure.

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 dB SINAD (Signal-to-Noise And Distortion ratio) 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.

- 2.3 The radio frequency ranges to be supported are any frequencies used by the area-wide public safety communications service provider. If signal amplifiers are used, they must include filters that will protect the amplifiers from overload and the system from interference by out-of-band signals.
- 2.4 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 and the District's communications network 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 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(s) and communicated to the Fire Chief and Officer in Charge of the North Vancouver RCMP detachment by the building owner.

Amplification Systems Allowed

- 2.5 Where a building or structure is required to provide an Amplification System to achieve adequate radio communication coverage, such system must 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 (BDAs) as needed;

- (c) voting receiver systems; or
 - (d) any other system accepted and approved by the Fire Chief and Police Chief, as signified in writing on a case by case basis.
- 2.6 If any part of the installed Amplification System contains an electrically powered component, the system must 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 (4) hours without external input or maintenance. All amplifiers and electronics required by the system must be protected by NEMA type 4 enclosures with physical security. The UPS must automatically charge the batteries in the presence of external power. The UPS must 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 is the responsibility of the person maintaining the equipment.
- 2.7 A system summary alarm, consisting of a relay contact closure or equivalent, must be provided to the building fire panel via a hard wired connection.
- 2.8 Radio equipment must only be selected from the ISED Radio Equipment List and all active systems must be licensed by the federal regulator, Innovation, Science & Economic Development Canada (ISED), and must comply with the applicable Standard Radio Systems Plan (SRSP). Any license required must be renewed annually by the building owner and the cost of the licensing borne solely by the building owner.

3. PROCEDURES TO VERIFY AND MAINTAIN COMPLIANCE

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

(a) Acceptance Test Procedure

- 3.1.1 Acceptance tests and measurements must be performed after completion of installation of the Amplification System. Tests must be performed using radio frequencies assigned to the area-wide public safety communications service provider and the District, after proper coordination with an agent for that system and with the Fire Chief.
- 3.1.2 If queuing occurs on the radio system while testing is underway, testing must be terminated immediately and resumed only when traffic levels on the system reach a level where queuing no longer occurs.
- 3.1.3 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.

- 3.1.4 Where the Shadowed Area or the floor plate area of a building is greater than 4,500 m², the area must be divided into a uniform grid of not more than 15 m on a side, or if the floor area is smaller than 4,500 m², it shall be divided into a uniform grid of approximately 20 equal areas to a minimum of 9 m², and measurements shall be taken in each grid area. The size of the grids must also be reduced, or the number of grids increased, upon recommendation of the Fire Chief or building official in areas where special construction or other obstruction may significantly affect communications. Tests must also be performed in fire command centres, stairwells, protect-in-place areas, lobby refuge areas, equipment rooms, and high-hazard areas.
- 3.1.5 Tests must first be made using a portable (handheld) radio of the type used by the District's Fire or Police service personnel, carried at chest level and using a simple flexible antenna, and will 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 1.5m 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.
- 3.1.6 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 4 m², 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.
- 3.1.7 If the Amplification System fails to provide acceptable communication in any fire command centre, portion of a stairwell, protect-in-place areas, lobby refuge areas, equipment rooms, or high-hazard areas, the building owner must have the system altered to meet the 100% coverage requirement for these areas, otherwise the Amplification System will not be accepted.
- 3.1.8 Backup batteries and power supplies must be tested under full load by generating communication traffic automatically for a duration of at least one (1) hour. If within this period the battery shows any 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 must not fail within a four (4) hour continuous test period.
- 3.1.9 Backup batteries and power supplies must be tested under full load by generating communication traffic automatically for a duration of at least one (1) hour. If within this period the battery shows any 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 must not fail within a four (4) hour continuous test period.

3.1.10 The gain values of all amplifiers must be measured, using a service monitor that has been calibrated by a certified laboratory within the past 12 months, and the results must 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

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

3.1.12 Additional tests or inspection of records may be conducted from time to time by the Fire Service 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 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 his or her control.

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

3.1.13 Tests must 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 must bear the seal of the engineer.

3.1.14 Portable radios used must be of a size and type as may be in use by the District Fire and Police services at the time and programmed to operate on an analogue test channel and on a digital test band channel as designated by the Fire Chief. SINAD, BER and signal strength measurements must be made using appropriate instrumentation acceptable to the Fire Chief and/or Officer in Charge of the North Vancouver RCMP detachment. Radios and measurement equipment must have been tested for conformance to design specifications within twelve months prior to the conduct of Amplification System acceptance tests or re-tests.

4. PERMIT AND OCCUPANCY CONDITIONS

4.1 A permit or occupancy permit will not be issued for any building or structure until the requirements of this bylaw have been met to the satisfaction of the Fire Chief.

5. RIGHT OF ENTRY

- 5.1 Every owner or occupant of a building must, at all reasonable times, permit building official or Fire Chief (or their designates) to enter into and inspect any building or structure 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.

6. DEEMED NUISANCE

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

7. OFFENCES AND PENALTIES

- 7.1 Every person who violates any of the provisions of this bylaw or who suffers or permits any act or thing to be done in contravention of this bylaw or who neglects to do or refrains from doing any act or thing which violates any of the provisions of this bylaw shall be liable to the penalties hereby imposed and each day that such violation is permitted to exist shall constitute a separate offence.

Enforcement by Ticket

- 7.2 This bylaw is designated pursuant to section 264 of the Community Charter as a bylaw that may be enforced by means of a ticket in the form prescribed.

Bylaw Enforcement Officers

- 7.3 Bylaw Enforcement Officers are designated to enforce this bylaw by means of a ticket pursuant to section 264 of the Community Charter.

Ticketing

- 7.4 The words or expressions listed below in the "Designated Expression" column are authorized to be used on a ticket issued pursuant to section 264 of the Community Charter to designate an offence against the respective section of this bylaw appearing opposite in the "Section" column. The amounts appearing in the "Fine" column below are the fines set pursuant to section 264 of the Community Charter for contravention of the respective section of this bylaw appearing opposite in the "Section" column.

COLUMN 1	COLUMN 2	COLUMN 3
DESIGNATED EXPRESSION	SECTION	FINE
		\$
Erect, construct, change use or add to building without adequate radio coverage	2.1	200
Failure to permit entry of inspector	5.1	200

READ a first time November 6th, 2017

READ a second time November 6th, 2017

READ a third time November 6th, 2017

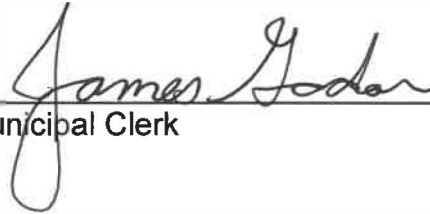
THIRD READING rescinded on December 4th, 2017

READ a third time as amended December 4th, 2017

ADOPTED December 11th, 2017



Mayor



Municipal Clerk

Certified a true copy

Municipal Clerk