



KAMLOOPS FIRE RESCUE IN-BUILDING RADIO COMMUNICATIONS PROGRAM

SUBJECT: *BUILDING AMPLIFICATION SYSTEM BYLAW NO. 10-45, 2025*

DATE: FEBRUARY 1, 2026

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PART 1 – DEFINITIONS

1.1 Unless otherwise stated in this In-Building Radio Communications Program, the words used in this Program have the same meaning as defined in *Building Amplification System Bylaw No. 10-45, 2025*.

1.2 Notwithstanding the case used (upper or lower case), when words or phrases that are defined in this section 1.2 are used in the body or schedules of this In-Building Radio Communications Program, they have the following meaning:

“Amplifier Gain” means the difference between the input signal and the output signal of the Amplification System;

“Fire Safety Plan” means a documented plan outlining fire safety measures, procedures, and equipment as required in accordance with the *Fire Code* and the *Building Code*;

“Public Safety Communications Provider” means the primary public safety communications service provider maintaining direct communications with first responders within the City;

“Qualified Test Operator” means a professional engineer registered in the Province of British Columbia and qualified in radio communications;

“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 or receiving site of the Public Safety Communications Provider; and

“Uninterruptible Power Supply” means an electrical apparatus that allows the Amplification System to continue running when its incoming power source is interrupted.

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PART 2 – ACCEPTABLE RADIOS

- 2.1 For the purposes of *Building Amplification System Bylaw No. 10-45, 2025*, and this In-Building Radio Communications Program, “Acceptable Radios” means portable radios that meet all of the following criteria:
- (a) system access and Delivered Audio Quality (“DAQ”) of 3.4 or higher;
 - (b) programmed to operate all mobile and portable radios in use by Kamloops Fire Rescue; and
 - (c) tested for conformance to design specifications within twelve (12) months prior to conducting any Amplification System testing under *Building Amplification System Bylaw No. 10-45, 2025*, or this In-Building Radio Communications Program.

PART 3 – ADEQUATE RADIO COVERAGE

- 3.1 For the purposes of *Building Amplification System Bylaw No. 10-45, 2025*, and this In-Building Radio Communications Program, “Adequate Radio Coverage” means radio coverage that meets all of the following criteria:
- (a) system access and Delivered Audio Quality (“DAQ”) of 3.4 or higher;
 - (b) communication between a portable (handheld) radio with a simple flexible whip antenna and the Public Safety Communications Provider radio communication sites whereby speech is understandable without repetition, albeit with some noise or distortion present;
 - (c) a received signal level of -85 decibel-milliwatts (dBm) or lower;
 - (d) a radio frequency range that supports all frequencies used by the Public Safety Communications Provider’s network;
 - (e) if signal amplifiers are used, filters that will protect the amplifiers from overload and the system from interference by out-of-band signals; and
 - (f) achieving the following coverage levels:
 - (i) at least ninety percent (90%) coverage of the area of each floor of the Building, including underground areas;



- (ii) one hundred percent (100%) coverage of those areas designed or designated in the Building as being fire command centers, stairwells, protect-in-place areas, lobby refuge areas, equipment rooms, and high-hazard areas; and
- (iii) at least ninety percent (90%) coverage in all Shadowed Areas.

PART 4 – AMPLIFICATION SYSTEM REQUIREMENTS

4.1 All Amplification Systems must meet the following requirements:

- (a) The Amplification System must include at least one of the following so as to achieve Adequate Radio Coverage:
 - (i) passive antenna systems or radiating cable systems;
 - (ii) distributed antenna systems with unidirectional or bi-directional amplifiers as needed;
 - (iii) voting receiver systems; or
 - (iv) any other system deemed acceptable by the Fire Chief in writing.
- (b) All amplifiers and electronics required by the Amplification System must be protected by National Electrical Manufacturer Association (NEMA) type 4 or higher enclosures.
- (c) The Amplification System must contain a system summary alarm, consisting of a relay contact closure or equivalent hard-wired into the Building's fire panel.
- (d) Every component of the Amplification System must be certified for use in Canada by Innovation, Science and Economic Development ("ISED") and listed in Canada's Radio Equipment List.
- (e) The Amplification System must be licensed by ISED and comply with the applicable Standard Radio Systems Plan, and in respect of licensing, the owner must:
 - (i) bear all costs associated with ISED licensing; and
 - (ii) renew ISED licensing annually.
- (f) The radio waves of the Amplification System must be contained within the footprint of the Building.



Electrically Powered Amplification Systems

- 4.2 Where any component of the Amplification System is electrically powered, the owner must ensure that:
- (a) The Amplification System is equipped to operate on an independent Uninterruptible Power Supply, using a battery or generator system or both, for a period of at least four (4) hours without external input or maintenance.
 - (b) Where the Uninterruptible Power Supply uses a battery, the Uninterruptible Power Supply must automatically charge the battery in the presence of external power.
 - (c) The Uninterruptible Power Supply must provide a monitored alarm signal that sounds in case of:
 - (i) failure of primary power;
 - (ii) failure of the Uninterruptible Power Supply system power output; and
 - (iii) discharge of the batteries.

Alarm Protocols

- 4.3 In the event that an alarm regarding the power supply or functionality of the Amplification System sounds, the owner must:
- (a) immediately notify Kamloops Fire Rescue by telephoning Kamloops Fire Rescue's non-emergency dispatch number at: 250-828-3490 or 250-828-3491 and reporting that the Amplification System is not functioning properly;
 - (b) immediately take steps to rectify the power supply or functionality of the Amplification System; and
 - (c) notify Kamloops Fire Rescue by telephoning Kamloops Fire Rescue's non-emergency dispatch number at: 250-828-3490 or 250-828-3491 and reporting that the Amplification System functionality has been restored.

PART 5 – OPERATIONAL INFORMATION AND EMERGENCY CONTACTS

- 5.1 In accordance with *Building Amplification System Bylaw No. 10-45, 2025*, the owner of a Building in which an Amplification System is required to meet the Adequate Radio Coverage requirements must provide notice to the Fire Chief as follows:



- (a) in the form and with the content attached as Schedule "A" to this In-Building Radio Communications Program; and
- (b) by submitting the notice by email to fireprevention@kamloops.ca.

5.2 In accordance with *Building Amplification System Bylaw No. 10-45, 2025*, the owner of a Building in which an Amplification System is installed must submit to Kamloops Fire Rescue a list of emergency contacts and other operational information as follows:

- (a) containing the following information:
 - (i) the name, phone number, and email address for a primary emergency contact person;
 - (ii) the name, phone number, and email address for a secondary emergency contact person;
 - (iii) a description of the location of the Amplification System within the Building; and
 - (iv) a description of the operational features of the Amplification System;
- (b) by submitting the information and any updates to the information by email to fireprevention@kamloops.ca; and
- (c) by including the information in the Building's Fire Safety Plan.

PART 6 – TESTING

6.1 The owner must ensure that all Acceptance Tests and Annual Tests required by *Building Amplification System Bylaw No. 10-45, 2025*, are performed:

- (a) by or under the direct supervision of a Qualified Test Operator; and
- (b) using Acceptable Radios.

6.2 The owner is responsible for all costs associated with the Acceptance Tests and Annual Tests required under *Building Amplification System Bylaw No. 10-45, 2025*.

Acceptance Test

6.3 All Acceptance Tests required by *Building Amplification System Bylaw No. 10-45, 2025*, must be performed as follows:



- (a) Immediately after installation of the Amplification System.
- (b) In accordance with the following procedure:
 - (i) Where the Shadowed Area or the floor plate of a Building is greater than four thousand, five hundred square metres (4,500 m²), the area must be divided into a uniform grid of not more than fifteen metres (15 m) on a side.
 - (ii) Where the Shadowed Area or the floor plate of a Building is less than four thousand, five hundred square metres (4,500 m²), the area must be divided into a uniform grid of approximately twenty (20) equal areas, to a minimum of nine square metres (9 m²) and measurements will be taken in each grid area.
 - (iii) The size of the grids must be reduced, or the number of grids increased, upon recommendation of the Fire Chief or Director in areas where special construction or other obstruction may significantly affect communications.
 - (iv) Tests must also be performed in fire command centers, stairwells, protect-in-place areas, lobby refuge areas, equipment rooms, and high-hazard areas.
 - (v) Tests must first be made using a portable (handheld) radio of the types used by emergency service personnel, carried at hip level (with external speaker/microphone) and using a simple “rubber ducky” 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 transmission in each direction. If system access is not reliable, or if DAQ 3.4 for five (5) seconds cannot be achieved at any location, the test operator may move a maximum of one and a half metres (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 will be recorded for that location.
 - (vi) 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.
 - (vii) A maximum of two (2) non-adjacent grid areas on a floor or in a Shadowed Area will be allowed to fail the test.



- (viii) 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 forty (40) approximately equal areas to a minimum of four square metres (4 m²), and the tests repeated, provided that a maximum of four (4) non-adjacent grid areas will be allowed to fail the test and if the Amplification System fails the 40-area test, the owner must have the Amplification System altered to meet the Adequate Radio Coverage requirements of *Building Amplification System Bylaw No. 10-45, 2025*, and this In-Building Radio Communications Program, otherwise the Amplification System will not be accepted.
- (ix) If the Amplification System fails to provide Adequate Radio Coverage in any of the fire command center, any portion of a stairwell, protect-in-place areas, lobby refuge areas, equipment rooms, or high-hazard areas, the owner must have the Amplification System altered to meet the 100% coverage requirement for these areas, otherwise the Amplification System will not be accepted.
- (x) 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 and, if within the one-hour period, the battery shows no symptom of failure or impending failure, the test must be continued for four (4) additional one-hour periods to determine the integrity of the battery, and the battery must not fail within a four-hour continuous test period.
- (xi) The Qualified Test Operator must measure the Amplifier Gain values of the Amplification System, using a service monitor that has been calibrated by a certified laboratory within the past twelve (12) months, and the owner must keep the results on file for future verification and performance monitoring. The Amplifier Gain records file must have multiple back-ups and be stored in more than one location.

6.4 Following every Acceptance Test, the owner must submit to Kamloops Fire Rescue a test confirmation letter in the form and with the content attached as Schedule “B” to this In-Building Radio Communications Program.

Annual Test

6.5 The Annual Tests required by *Building Amplification System Bylaw No. 10-45, 2025*, must be performed in accordance with the following procedure:

- (a) all active components of the Amplification System, including but not limited to all amplifiers, power supplies, and back-up batteries, must be tested as follows:



- (i) the Amplifier Gain must be adjusted to re-establish the Amplifier Gain recorded upon the Acceptance Test;
- (ii) test batteries and power supplies must be under load for a period of at least one (1) hour to verify that they will function properly during a power outage; and
- (iii) the owner must keep a record of each Annual Test as part of the Fire Safety Plan for inspection by Kamloops Fire Rescue.

6.6 Following every Annual Test, the owner must submit to Kamloops Fire Rescue a test confirmation letter in the form and with the content attached as Schedule "B" to this In-Building Radio Communications Program within 30 days of the Annual Test.



SCHEDULE "A"
Test Confirmation Letter Template

Kamloops Fire Rescue
1205 Summit Drive
Kamloops BC V2C 5R9

Attention: Fire Chief, Kamloops Fire Rescue

Re: Notice of Amplification System Requirement

Date: _____

Building Owner Name(s): _____

Owner's address & contact information: _____

Building Name: _____

Building Address: _____ (the "Building")

Reference: *Building Amplification Bylaw No. 10-45, 2025* (the "Bylaw") and Kamloops Fire Rescue In-Building Radio Communications Program

TAKE NOTICE THAT, pursuant to the Bylaw, an Amplification System is required at the Building to meet the Adequate Radio Coverage requirements set out in the Bylaw and the In-Building Radio Communications Program.

Name of Owner: _____

Signature of Owner: _____



SCHEDULE "B"
Test Confirmation Letter Template

Kamloops Fire Rescue
1205 Summit Drive
Kamloops BC V2C 5R9

Attention: Fire Chief, Kamloops Fire Rescue

Re: Certification of Amplification System Acceptance Test or Annual Test

Date: _____

Building Owner Name(s): _____

Owner's address & contact information: _____

Building Name: _____

Building Address: _____ (the "Building")

Reference: Building Amplification Bylaw No. 10-45, 2025 and Kamloops Fire Rescue
In-Building Radio Communications Program

I, _____ hereby certify that,
on this _____ day of _____ 20 _____

1. The [Acceptance Test or Annual Test] required under Building Amplification Bylaw No. 10 45, 2025, was carried out at the Building in compliance with the requirements of the In-Building Radio Communications Program.
2. The results of the [Acceptance Test or Annual Test] required under Building Amplification Bylaw No. 10-45, 2025, meet the Adequate Radio Coverage requirements set out in the Bylaw and the In-Building Radio Communications Program.
3. The Amplification System meets the manufacturer's minimum performance and functional specifications.
4. The installation of the Amplification System and all equipment and materials conform to industry accepted standards and best practice.

Name of Qualified Test Operator: _____

Signature of Qualified Test Operator: _____