

CITY OF KELOWNA

BYLAW NO. 11747

Amendment No. 2 to Fire and Life Safety Bylaw No. 10760

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts that the City of Kelowna Fire and Life Safety Bylaw No. 10760 be amended as follows:

1. **THAT PART FIVE: FIRE PROTECTION EQUIPMENT, 5.1 Buildings and Occupancies, 5.1.1 MAINTENANCE AND TESTING** be amended by deleting the following sections:

"5.1.1 Every owner of premises must ensure that all fire protection equipment required under the Building Code or Fire Code shall be inspected, tested and maintained in accordance with good engineering practices and the applicable standards, requirements and guidelines of the British Columbia Building Code, the City's Building Bylaw No. 7245, the British Columbia Fire Code, this Bylaw and all other applicable enactments, all as amended or replaced from time to time, and any equivalents or alternative solutions required or accepted under those enactments.

5.1.2 A "Notice of Responsibility" form shall be used to document and officially notify building owners/ representative(s) of what is expected of them by the Kelowna Fire Department regarding the restoration of the building's fire protection systems and the owner/ representative's fire watch duties.

The "Notice of Responsibility" form may be used in the following circumstances:

- a) When a building's fire protection system(s) have been compromised.
- b) When a building's fire protection system will not restore to normal working condition.
- c) When a FIRE WATCH is required."

And replace them with:

"5.1.1 MAINTENANCE AND TESTING

- (a) Every Owner or Occupant of a premise for which a system of fire protection equipment is installed or required under the Building Code or Fire Code must:
 - (i) inspect, test, record, maintain, and repair the system in accordance to the standards and requirements of the Building Code and Fire Code;
 - (ii) where a Fire Protection Service Technician has inspected or tested fire protection equipment pursuant to 9.1 of this bylaw, the fire protection technician shall label the equipment and the owner or occupant shall maintain records in a manner acceptable to the authority having jurisdiction; and
 - (iii) promptly notify the Fire Department:
 1. if the system or any part of it has been taken out of service, becomes inoperable, or has otherwise stopped functioning properly; and
 2. report to the Fire Department when the service is restored, is fully operable and functioning properly.

- (b) Every Owner or Occupant who is required under the Fire Code to perform or cause to be performed an inspection or test of fire protection equipment must ensure that:
 - (i) the inspection or test is performed by a Fire Protection Service Technician;
 - (ii) a copy of the inspection and/or test form completed by the Fire Protection Service Technician is delivered to the Fire Department; and
 - (iii) all deficiencies are completed by the date provided and delivered to the Fire Department.
- (c) Every Fire Protection Service Technician who carries out inspections, testing, maintenance or repair of fire protection equipment must use an inspection and testing form that is acceptable to the Fire Chief.
- (d) No person shall undertake any work or testing on fire protection equipment or life safety systems that sends an alarm directly to an alarm monitoring company without notifying that company prior to undertaking the work or testing.
- (e) The Owner or Occupant shall correct any deficiencies to the fire alarm or sprinkler system when the Fire Department attends a premise where a fire alarm or sprinkler system has been activated without proper cause.

5.1.2 Every owner of premises must ensure that all fire protection equipment required under the Building Code or Fire Code shall be inspected, tested and maintained in accordance with good engineering practices and the applicable standards, requirements and guidelines of the British Columbia Building Code, the City's Building Bylaw No. 7245, the British Columbia Fire Code, this Bylaw and all other applicable enactments, all as amended or replaced from time to time, and any equivalents or alternative solutions required or accepted under those enactments.

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The "Notice of Responsibility" form may be used in the following circumstances:

- a) When a building's fire protection system(s) have been compromised.
- b) When a building's fire protection system will not restore to normal working condition.
- c) When a FIREWATCH is required.

2. AND THAT **PART FIVE: FIRE PROTECTION EQUIPMENT, 5.5 Smoke Alarms**, be amended by:

- a) deleting the title that reads "**Smoke Alarm**" and replace it with "**Smoke Alarm / Carbon Monoxide Alarms**";
- b) deleting section 5.5.1 that reads:

"The owner and occupier of every premise with residential occupancy must ensure that smoke alarms are maintained, tested, repaired and replaced in accordance with the requirements of the manufacturer."

And replace it with:

"The owner and occupier of every premise with residential occupancy must ensure that operational smoke alarms and carbon monoxide alarms (if required) are maintained, tested, repaired and replaced in accordance with the requirements of the manufacturer."; and

c) adding the following sentence to the beginning of the Section 5.5.2:

"Operational smoke and carbon monoxide alarms must adhere to the standards of the British Columbia Building Code, the British Columbia Fire Code and Amendments thereto. "

3. AND THAT **PART FIVE: FIRE PROTECTION EQUIPMENT, 5.9 Premises Under Construction**, be amended by adding a new section 5.9.5 that reads as follows:

"5.9.5 The City of Kelowna Fire Safety Plan for Construction, Demolition and Renovation form must be submitted to the fire department for review prior to the commencement of construction."

4. AND THAT **PART SEVEN: EMERGENCY ACCESS AND EVACUATION** be amended by deleting Section **7.1 Construction Fire Safety Plan** in its entirety that reads:

"7.1 Construction Fire Safety Plan

7.1.1 Before construction of any building commences the owner or occupier of the property must contact the Fire Department to determine whether a fire safety plan is required.

7.1.2 Where the Fire Chief or designate determines that a fire safety plan is required, the owner or occupier must:

- a) prepare the construction fire safety plan in a form, format and diagram template acceptable to the Fire Chief or designate and submit the construction fire safety plan to the Fire Prevention Branch for review;
- b) ensure a copy of the construction fire safety plan is maintained on the premises in a location and manner acceptable to the Fire Chief or designate to allow for reference by the Fire Department.";

5. AND THAT **PART NINE: SAFETY TO LIFE, 9.1.8** be amended by adding the following to the end of the paragraph "Fire separations shall be maintained as per the BC Fire Code.";

6. AND THAT **PART FOURTEEN: HIGH BUILDINGS, 14.1 Buildings 6 or more storeys** be amended by:

a) deleting the title that reads "**14.1 Buildings 6 or more storeys**" and replacing it with "**14.1 high buildings as per the British Columbia Building Code**";

b) deleting in Section 14.1.1 that reads:

"The owner of any building of six or more storeys, and for which an application for a building permit is submitted to the City after August 1, 2008, shall ensure that;"

And replace it with:

"It is recommended that the owner of any high buildings as per the British Columbia Building Code, for which an application for a building permit is submitted to the City after August 1, 2008, provide the following:"

- c) Deleting sub-sections, a & b in their entirety that read:
 - "a) pressurized stairwells are marked clearly, including roof access stairwells; stairwell doors shall be marked on both sides;
 - b) an approved Fire Department lock box is installed in accordance with section 7.4 of this Bylaw;"
- d) Deleteing "30 minute" and replacing it with "45 minute" in sectin 14.1.1 subsectin d); and
- e) Deleting sub-sections e & f in their entirety that read:
 - "e) a copy of the construction fire safety plan is provided in accordance to section 7.1 of this Bylaw;
 - f) a copy of the building fire safety plan is provided in accordance to section 7.2 of this Bylaw."

7. AND THAT **PART FIFTEEN: COMMUNICATIONS, 15.1 Emergency Services Communications Equipment, 15.1.1** be deleted in its entirety that reads:

- "15.1.1 If the design of a proposed building does not, in the opinion of the Fire Chief or designate, facilitate or permit emergency services communication between the interior of the building and the Fire Department personnel assembling at the exterior of the building in response to an incident, the owner must install and maintain in or on the building one of the following:
- a) a passive antenna or radiating cable system;
 - b) an internal multiple antenna system with unidirectional or bi-directional amplifiers as needed;
 - c) a voting receiver system; or
 - d) any other system proposed by the owner and approved in writing by the Fire Chief or designate as meeting the requirements of the emergency services communications system."

And replace it with:

- "15.1.1 The design and construction of new buildings shall provide reliable two-way radio communications for emergency responders inside the buildings to command vehicles in accordance with Schedule C. Prior to **occupancy**, the installed system will be subject to a field test and approval by the Kelowna Fire Department to ensure that it meets the Kelowna Fire Department's operational needs."

8. AND THAT **PART TWENTY TWO: FEES AND COST RECOVERY, 22.1 Permit and Service Fees, 22.1.1** be amended by adding new sub-paragraphs (l) and (m) that read:

- "l) an additional inspection(s) of a burn pile, if on the initial inspection by the fire department the burn pile or site is deemed unacceptable;

- m) a yearly inspection of a mobile vender, fee to be waved if the inspection is done on a designated weekend."

9. AND THAT **SCHEDULE "A" Interpretation** be amended by:

- a) adding a definition for **ASTTBC** in its appropriate location that reads:

"**ASTTBC**" means Applied Science Technologist and Technicians of BC which is a self-governing, professional association pursuant to the Applied Science Technologist and Technicians Act RD CHAP. 15, 1996.";

- b) adding a definition for **Fire Protection Service Technician** in its appropriate location that reads:

"**Fire Protection Service Technician**" means a person certified under the Applied Science Technologists and Technicians Act "ASTTBC" as a fire protection technologist, or a person having other equivalent certification acceptable to the Fire Chief, that qualifies the person to perform inspections and testing of fire protection equipment.";

- c) adding a definition for **Mobile Vendor** in its appropriate location that reads:

"**Mobile Vendor**" means cooking equipment used in fixed, mobile or temporary concessions, such as trucks, buses, trailers, pavilions, tents, or any form of temporary roofed enclosure. The authority having jurisdiction can exempt temporary facilities, such as a tent, upon evaluation for compliance to the applicable requirements."; and

- d) deleting the definition for "firewatch" that reads:

"**firewatch**" The assignment of a person or persons to an area for the express purpose of notifying the fire department, the building occupants, or both of an emergency; preventing a fire from occurring; extinguishing small fires; or protecting the public from fire or life safety Dangers

and replace it with a new definition that reads:

"**firewatch**" means the assignment of a person or persons to an area for the express purpose of assuming the responsibility of notifying the fire department, the building occupants, or both, of an emergency; preventing a fire from occurring; extinguishing small fires; or protecting the public from fire or life safety dangers;"

10. AND THAT **SCHEDULE "B" FEES AND COST RECOVERY** be amended by adding to the end of the Table the following new line:

"Re-inspection of burn pile	22.2	\$50.00
Inspection of a mobile vender (waved if done on a designated weeked)	22.2	\$50.00"

11. This bylaw may be cited for all purposes as "Bylaw No. 11747 being Amendment No. 2 to Fire and Life Safety Bylaw No. 10760";
12. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Schedule C

In-Building Radio Communications Coverage

1.0 PREFACE

This Schedule (Schedule C) shall be the reference document for ensuring and verifying minimum acceptable emergency radio communications reliability inside buildings to meet the emergency response needs of the Kelowna Fire Department (KFD).

This Schedule specifies the minimum radio communications reliability requirements and the procedures and testing requirements for verifying the acceptability of the radio communications coverage inside a building.

Please note that this Schedule shall be used as the reference by KFD to determine the acceptability (or unacceptability) of the in-building radio communications reliability.

2.0 IN-BUILDING RADIO COMMUNICATIONS REQUIREMENTS

2.1 Definition of Reliable Two-Way Radio Communications

Reliable two-way radio communications as defined below shall be achieved between personnel inside the building communicating over the KFD simplex "tactical" radio frequency channel with personnel outside the building.

All two-way radio communications in both directions shall meet a Delivered Audio Quality defined as follows:

"Understandable possibly with some noise"

(DAQ 3.4 – 4.0 as defined in Telecommunications Industry Association TSB 88 standards in all locations and under the operating conditions specified below).

2.2 Description of Interior Building Coverage Requirements

Reliable two-way radio communications shall be achieved in the following areas and locations inside the building:

Location		Floor Area for Reliable Two-Way Radio Communications
1.	Public access hallways, elevator lobbies	95% of each area on each floor
2.	Living areas	95% of each enclosed areas within each living area
3.	Parking garage	95% of all areas on each level
4.	Common rooms, recreation rooms and recreation areas such as pools, hot tubs, gyms	95 % of each enclosed areas and each open area
5.	Foyers, lobbies, atriums, and enclosed entranceways.	95% of each enclosed area and each open area

Location		Floor Area for Reliable Two-Way Radio Communications
6.	Stairwells	100 % of all areas within each stairwell
7.	Elevators	100% inside closed elevators
8.	Designated refuge areas (shelter in-place and protected areas)	100 % of each enclosed area and each open area
9.	Mechanical and electrical rooms	100% of all areas within each room
10.	Storage areas including hazardous materials storage (paints, solvents, cleaning supplies, etc.)	100% of each enclosed area and each open area
11.	Fire command centres, alarm panel locations	100% of each enclosed area and at each location in open areas.
12.	Commercial parking garages	95% of all areas on each level
13.	Individual offices and open office areas	95% of each enclosed area and each open area
14.	Warehouse, manufacturing and fabricating plant areas, enclosed rooms and open areas	95% of each enclosed area and each open area
15.	Retail malls, individual retail stores, open mall areas	95% of each shop, each enclosed area and each open area
16.	Locations, and areas not listed above will be at the discretion of the Fire Chief	

Note: The building interior shall be completely constructed with all exterior and interior walls, doors and windows installed.

2.3 Personnel Communications

Reliable two-way radio communications shall be achieved in the above areas between personnel inside the building using a handheld (portable) radio communicating with personnel outside the building who are communicating using a vehicle mobile radio.

The radio communications reliability minimum requirements shall be met when:

1. personnel inside the building are using handheld (portable) radios that are equipped with a flexible whip or helical style antennas with a length not exceeding $\frac{1}{8}$ wavelength and the antenna is securely connected to the antenna connector on the radio.
2. personnel outside the building are using a vehicle mounted radio (mobile) that is connected to a whip style antenna not exceeding $\frac{1}{4}$ wavelength mounted on the roof of the vehicle.

The location of the vehicle shall be specified by the Fire Department.

2.4 Wearing Handheld (Portable) Radio

The reliable two-way radio communications requirements shall be met when the radio is worn in a holster or on a clip on the belt of the person at the waist with the radio antenna against the body and shielded by the person's arm.

2.5 Personnel Body Position Variations

Reliable two-way radio communications shall be met when the person is standing facing North, East, South, and West

3.0 **INITIAL DEMONSTRATION OF TWO-WAY RADIO COMMUNICATIONS RELIABILITY**

The following shall be carried out after the building has been completed. The building interior shall be completely constructed with all exterior and interior walls, doors and windows installed.

3.1 Handheld (Portable) Radio Equipment Preparation

1. The handheld radio transmitter and receiver (transceiver) shall be tested in accordance with radio equipment manufacturer's instructions to verify that the radio transmitter and receiver performance meets the manufacturer's minimum performance standards and specifications, and shall be in full compliance with relevant Innovation, Science & Economic Development (ISED) standards and specifications, in accordance with the KFD radio station license.
2. The handheld radio battery shall be fully charged and shall not be below the minimum battery charge level for full performance as specified by the radio manufacturer at any time throughout all two-way radio communications tests.
3. The antenna shall be a flexible, helical style antenna (rubber duckie style), free from all defects and damage, and shall connect securely to the transceiver antenna terminal.
4. The handheld radio transmitter output power shall not exceed 5 Watts.
5. The handheld radio shall be equipped with an external/remote speaker microphone to enable the radio to be operated when the radio is in the holster or on a clip at the waist.
6. The external speaker microphone shall be tested with the radio in accordance with the manufacturer's instructions to verify that the radio transmitter modulation level and the voice quality meet the manufacturer's specification and the quality of the received audio in the speaker/microphone is clear and noise-free.
7. The external/remote speaker microphone shall be free from all defects and damage, and shall connect securely to the transceiver connector.

3.2 Vehicle (Mobile) Radio Equipment Preparation

A KFD fire engine, or similar KFD vehicle with an installed radio and rooftop mounted ¼ wave whip antenna shall be used for the tests.

1. The radio transmitter and receiver (transceiver) shall be tested in accordance with the radio manufacturer's instructions to verify that the radio transmitter and receiver performance meets the manufacturer's minimum performance standards and specifications and shall be in full compliance with relevant ISED standards and specifications, in accordance with the KFD radio station license..
2. The radio tests shall include the vehicle radio microphone to verify that the transmitter modulation level using the microphone meets the manufacturer's specification, and the transmitted audio (modulation) is noise and distortion free.

3. The transceiver shall be connected to a $\frac{1}{4}$ wave whip antenna mounted on the roof of the vehicle for testing purposes.
4. The antenna and antenna cable shall be free from defects and damage and shall be securely connected to the transceiver antenna terminal.

3.3 Mapping The Areas To Be Tested

Each floor including all levels in parking garages (if applicable) shall be divided into equal area grids to cover all floors throughout the entire building.

Each grid shall not exceed 6 meters by 6 meters.

For large open area structures, such as storage buildings or warehouses, the grid pattern may be larger at the sole discretion of the Fire Chief.

In the case of hallways or areas that may be narrower than 6 metres, and the grid extends into adjacent enclosed areas or rooms, each separate enclosed area or room within the same grid shall be considered to be a separate grid.

The grid shall be overlayed on the floor plans of each floor including parking garages, and each grid shall be labeled with a unique identifier that shall be recorded on the test record forms for each two-way radio communications test.

3.4 Two-Way Communications Reliability Demonstration Procedure

The two-way radio communications tests shall be conducted at each location within each grid as specified above.

The tests shall be carried out with the test personnel positioned in the middle (centre) of each grid (as close to centre as practical).

In enclosed areas that are smaller than 6 metres by 6 metres, the test personnel shall stand in the approximate centre of the area, or as close to the centre of the area as practical.

At each test location, two-way radio communications tests shall be carried out under the following conditions by the test personnel inside the building:

Test Personnel with Handheld Radio Inside Building		
Position	Facing	Radio On Body
Standing	North, East, South, West	Radio worn in a holster or a belt clip on the test personnel belt at waist level – test personnel arm shielding antenna

1. The in-building test personnel shall make initial communications contact with the test personnel at the outside vehicle location.
2. When contact has been established, the in-building personnel shall transmit a voice message speaking clearly and slowly counting from 1 – 5.

3. The test personnel shall speak directly into the speaker/microphone approximately 5 cm from the microphone.
4. Vehicle test personnel shall transmit their assessment of the quality of the received transmissions to the in-building personnel who shall record the vehicle test personnel's assessment on the test record form for each grid location.
5. After recording the vehicle test personnel assessment on the test record form, the in-building test personnel shall request a clear, slow count from the vehicle test personnel in the same manner as the transmissions by the in-building personnel.

Note: The vehicle test personnel shall verify that there is very low, or no significant local area ambient (background) acoustical noise that could affect the quality of the voice transmission to the in-building test personnel.

6. The vehicle test personnel shall transmit a voice message speaking clearly and slowly counting from 1 – 5.
7. The test personnel shall speak directly into the microphone approximately 5 cm from the microphone.
8. The in-building test personnel shall record their assessment of the quality of the voice message received from the vehicle transmission on the test record for each grid location.

Note: If either the vehicle test personnel or the in-building test personnel suspect that the other end is transmitting a voice message but there is no reception or the received voice is not understandable, contact may be required using commercial mobile telephone service to have the transmission repeated until a firm assessment of the received voice message is made.

3.5 Radio Communications Voice Quality Assessment

The assessment of the quality of each voice message received by the vehicle test personnel and the in-building test personnel shall be one of the following and recorded on the test record for each two-way test:

- 0: No voice or communications
- 1: poor or noisy- barely understandable (DAQ = 1 -2)
- 2: understandable possibly with some noise (DAQ 3.0 – 4.0)
- 3: loud and clear, no noise (DAQ 4.5 – 5.0)

One of the above assessments shall be recorded on the test form for each test voice message received by the vehicle test personnel and the in-building test personnel at each test location inside the building and for each handheld radio and body position specified below.

3.6 Reliability Evaluation

1. For any grid, assessments 2 and 3 in both directions: Pass

A Pass assessment shall be for reception of voice messages by the vehicle test personnel and for reception of voice test messages by the in-building test personnel for the same test location and all body and handheld radio positions specified below.

2. For any grid, assessments 0 and 1 in either or both directions: Fail

A fail assessment shall be for reception of a voice test message by either the vehicle test personnel or by the in-building test personnel (or both).

3. On each floor and in separately identified areas in 2.2 above that do not require 100% radio communications coverage reliability:
- The total number of "Pass" locations divided by the total number of grid locations in each separately identified area shall be at least 95% of the total grid locations for voice communications in both directions; i.e. from the vehicle test personnel to the in-building test personnel, and from the in-building test personnel to the vehicle test personnel.

Note: Failure of any 2 adjacent grids in any area shall result in failure of the entire area including all grids within the area; for example, if an area is covered by 3 or more grids, failure of 2 adjacent grids shall result in failure of all grids in the area for purposes of calculating areas of reliable coverage.

4. In the case of partial grids, such as in hallways or areas that may be narrower than 6 metres, and the grid extends into adjacent areas or rooms, each separate area or room within the same grid shall be considered to be a separate grid for purposes of calculating the acceptable coverage area.
5. In locations and areas identified in 2.2 above requiring 100% radio communications coverage reliability:
- All test results in both directions; i.e. by the vehicle test personnel and by the in-building test personnel shall be assessed based on the pass and fail criteria in 1 through 5 in 3.5 above.
 - A failure in any part of an area defined as requiring 100% coverage shall be a failure of the entire area.

4.0 FIRE DEPARTMENT REPORT

KFD will prepare a report that references the two-way radio communications test results and specifies the acceptability or unacceptability of the radio communications coverage throughout the inside of the building in accordance with this Schedule.

5.0 USE OF TECHNOLOGY

5.1 General

The design and installation of any technology that may be required to meet the in-building radio communications reliability requirements, including Distributed Antenna Systems (DAS), bi-directional amplifiers (BDAs), radiating cable, passive reflectors and antenna systems shall meet industry accepted standards and best practice for public safety radio communications systems.

The technology shall meet and as applicable be approved for the intended application in accordance with (ISED Canada standards and specifications CPC-2-1-05 "Zone Enhancers" and RSS-131 "Zone Enhancers for the Land Mobile Service").

All system design and installation shall meet all applicable municipal, provincial and federal codes and regulations.

Other references:

1. Radio manufacturer's maintenance manual and test and maintenance instructions.
2. Telecommunications Industry Association:
 - TIA Systems Bulletin TSB 88: Wireless Communications Systems Performance In Noise And Interference Limited Situations
 - EIA/TIA 603: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
 - TIA 156 – Land Mobile Radio Antenna Systems Minimum Standards for RF Signal Booster

All technology shall use an electrical power source that shall not be disabled or disrupted if the primary Fortis BC power source fails or is interrupted.

Backup electrical power in the event of Fortis BC power failure or interruption may be provided by either a building provided backup power source such as an auxiliary power generator or a self-contained backup battery power source that shall maintain full electrical power capabilities for all technology for a minimum of 4 hours during continuous in-building emergency radio communications.

The use of any in-building radio coverage enhancement technology shall not result in spurious radiation (RF leakage) outside the building except via dedicated, intentional antennas or other intentional radiators required for the in-building coverage enhancement technologies.

Any spurious or leakage radiation outside the building shall not result in any degradation of the performance of any radio communications used by KFD or any other other emergency responders in the area.

5.2 As-Built Drawings and Specifications

As built drawings shall be provided for any technology that is added to the building design or structure specifically to improve the in-building radio communications coverage.

The drawings shall detail the specific technology make and model numbers, interconnections and schematic or block diagrams of the interconnected technology.

6.0 ULTIMATE AUTHORITY

The Fire Chief, or designate, shall have ultimate authority to accept or reject the reliability of the radio communications inside the building, and the test reports submitted by the building owner.

7.0 ANNUAL COVERAGE VERIFICATION TESTS & INSPECTIONS

The following tests, measurements and inspections shall be carried out annually from the date of acceptance of the initial demonstration tests (Section 3.0 in this Schedule).

The two-way voice communications tests shall verify that the in-building radio signal reliability and voice quality assessment for two-way handheld radio communications has not degraded since the tests were conducted initially in Section 3.0.

The technology measurements (as applicable) and installation shall meet the requirements specified in this Schedule.

The annual verification tests, measurements and inspections shall be the responsibility of the building owner (Owner).

The Owner shall certify to KFD in a written statement, that the two-way voice communications quality, the technology and installation continue to meet the requirements specified in this Schedule.

Personnel who are assigned to carry out the two-way radio tests shall be proficient in the use of handheld radios and possess sound knowledge of radio communications voice quality assessment and testing procedures.

Personnel who are assigned to the measurement of the technology and the system inspection shall be fully qualified technicians having sound skills and strong experience with the installation, measurement and inspection of radio communications equipment and previous experience with in-building radio communications coverage enhancement systems.

7.1 Test Radio Equipment Preparation

All radio equipment shall be prepared for the tests in accordance with Sections 3.1 and 3.2 in this Schedule.

7.2 Building Test Locations & Tests

The test locations selected for the annual verification tests shall be based on the grid (map) used for the initial demonstration tests described in Section 3.3 in this Schedule.

1. On each floor of the building, including parking garages in areas identified as 95% coverage in Section 2.2 of this Schedule:
 - a) At least 2 grids on each floor.
 - b) Grids selected from the grids used for the original tests conducted after building completion under Initial Demonstration of Two-Way Radio Communications Reliability tests, (Section 3.3 in this Schedule) .
 - c) Centre of each selected grid shall not be exposed to windows.
 - d) Conduct tests as specified in 3.4 in this Schedule.
 - e) For each test location, assess the two-way voice communications quality as defined in 3.5.
 - f) Evaluate the two-way radio coverage reliability as specified in 3.6 of this Schedule.
2. In each location identified as 100% coverage in Section 2.2 of this Schedule:
 - a) At least 1 two-way voice communications test in each location.
 - b) Each location shall be the same as the location used for the original tests conducted after building completion under Initial Demonstration of Two-Way Radio Communications Reliability tests, (Section 3.3 in this Schedule).
 - c) The location shall not be exposed to windows unless window exposure in the location is unavoidable because of the size or the location of the room or space in the building.
 - d) Conduct tests as specified in 3.4 in this Schedule.

- e) For each test location, assess the two-way voice communications quality as defined in 3.5.
- f) Evaluate the two-way radio coverage reliability as specified in 3.6 of this Schedule.

7.3 Technology Measurements & Inspections

If technology is used for enhancing the in-building two-way radio communications coverage, such as bi-directional amplifiers (BDA) and distributed antenna system (DAS), the technology shall be determined to be functioning properly by making basic measurements of the amplifier uplink and downlink gain.

The measurement results shall be within the manufacturer's specified limits, and shall be the same as the measurement results that were conducted when the equipment was originally installed.

All antennas, interconnecting cables, and connectors shall be inspected for damage, loose connections, etc.

Any equipment or cables that are located on the exterior of the building and are exposed to the weather shall be inspected for water damage to the equipment and moisture leakage inside the connectors and cables.

Any damaged cables shall be replaced and all loose connections tightened based on industry accepted best practices.

After replacement or repair of any equipment, antennas, or cables the two-way voice communications tests specified in Section 7.2 of this Schedule shall be repeated in the areas that are affected by the repairs or replacement.

7.4 Test Results Confirmation Letter

A test confirmation letter shall be prepared that clearly, and definitively confirms that the annual coverage verification tests, measurements and inspection meets the requirements in accordance with this Schedule and as specified in Sections 3.5 and 3.6.

The test confirmation letter shall be completed using the template attached as part of this Schedule.

PALIDOR Radio Communications Consultants

Annual Test Confirmation Letter Template

Date

Building Owner Name(s)

Owner's address & contact information

Building Name

Building Address

Fire Chief

Kelowna Fire Department

2255 Enterprise Way

Kelowna, BC V1Y 8B8

Certification of In-Building Radio Communications Annual Coverage Testing, Measurements and Inspection of *[Insert Name and Address of Building]*

Reference: City of Kelowna Fire and Life Safety Bylaw No. 10760, Schedule C.

Date(s) of Tests, Measurements and Inspection: Insert date(s) as applicable

We hereby certify that:

1. The annual coverage verification tests, measurements, and system inspections were carried out in full compliance with the requirements in this Schedule.
2. The results of the two-way voice communications tests meet the minimum two-way voice communications quality requirements specified in this Schedule.
3. The technology meets the manufacturer's minimum performance and functional specifications.
4. The installation of the in-building radio coverage enhancement technology and all equipment and materials conform to industry accepted standards and best practice.

Name (Owner or Owner's representative)

Title

Signature

Date