

## Fire Alarm Systems - Frequently Asked Questions

### 1. Why do I need a building permit (for a fire alarm system)?

A Fire Alarm System is not only an electrical system but a vital part of the fire protection system for the building. We know that many lives have been saved by fire alarm systems and is arguably the most important fire protection system in the building.

Existing FAS usually do not meet present-day standards. Any new or upgraded FAS will need to meet present-day standards

- BCBC 2012 Article 3.2.4;
- ULC S524 (installation);
- ULC-S536 (inspection & testing);
- ULC-S537 (verification)

The basic requirements for a fire alarm system are covered in BC Building Code 2012 SubSection 3.2.4

- is a FAS required or not? Article 3.2.4.1
- extent of FAS coverage? Article 3.2.4.2
- type & location of FAS? Article 3.2.4.3
- type of fire detector required? Article 3.2.4.11 & 3.2.4.12
- location of annunciator panel? Article 3.2.4.9
- zones? Article 3.2.4.9
- electrical supervision? Article 3.2.4.10
- audibility levels? Article 3.2.4.19

As well, there maybe are requirements for:

- protection of fire separations;
- emergency lighting & exit signage

The BC Building Code is administered by Building Officials and a Building Official is brought into the loop by the Building Permit.

### 2. What permits do I need?

**Building and Electrical Permits** are required If:

- new or an upgraded fire alarm system is installed
- additional annunciator panels are installed
- additional field devices are installed
- replacement of a control panel or annunciator panel or
- field devices are relocated

**Building Permits only** (no Electrical Permit) is required if

- there is straight replacement of 6 or more similar field devices (no new wiring); or
- there is a straight replacement of any dissimilar field devices (e.g. heat detector for a smoke detector) (no new wiring)

**No Building and Electrical Permits** are required if 5 or less **similar** field devices (existing heat detector is replaced for a new heat detector as an example) are replaced

FYI - a fire alarm verification report is always required whenever an existing system is modified.

### 3. What is the costs for a Building & Electrical Permit?

Building Permit fees = \$100 + 1.4% x non electrical construction cost

Electrical Permit fees varies

Electrical permits - contractor	Cost of electrical work: \$36 - \$61 for work under \$1,000 2% of work + \$61 for up to \$20,000 1.25% + \$441 for over \$20,000
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As an example, \$20,000 for new fire alarm system

BP fees = \$100

EP fees = \$61 + 2% x \$20,000 = \$61 + \$400 = \$461

Total permit fees = \$561

### 4. What documents needs to be submitted to the City for a building permit?

When **New & Additional Devices** are installed

- 1) Building & Electrical Permit applications
- 2) Sealed engineering drawings to include:
  - a) Basic floor plans showing exits, fire separations, zones, etc.
  - b) Location of annunciator, control panel & field devices
  - c) Electrical engineering drawings to include
    - riser diagram;
    - wiring (“one line” zone) drawings
- 3) Manufacturer’s Information on all equipment to be installed;
- 4) Design Professionals Schedule’s A & B
  - Schedule A could by the same Registered Professional who is submitting the Schedule B (i.e. the Electrical Engineer)

When **Replacement of control unit, annunciator or similar field devices** are installed

- 1) Building and Electrical Permit applications;
- 2) Manufacturer's Information on all new equipment installed
- 3) No engineering input required if manufacture's literature on new products demonstrates compatibility with other FAS equipment (including all existing devices)

## 5. When is a Fire Alarm System Verification Report required?

**Any modification** to a fire alarm system requires verification (as specified in CAN/ULC S537) (even when a there is no building permit issued).

When there is no building permit issued, the verification report is to be submit to the owner for their records and a copy placed with the Fire Safety Plan

When there is a building permit issued, a verification report is to be submit to the City of Victoria (as well as the owner)

## 6. When does the City want a Fire Alarm Demonstration?

When no electrical or building permit is issued then no demonstration (to the City) is required. When an electrical or building permit is issued then a demonstration (to the City) is required. Generally the level of demonstration is as follows

- new or upgraded FAS → full demonstration required
- replacement of control panel → full demonstration required
- replacement or additional annunciator panel → partial demonstration required
- additional field devices → partial demonstration or no demonstration (at the discretion of the City inspectors considering the disruption to the occupants & extent of added devices)

## 7. What are the steps in the typical Fire Alarm permit process?

1. Submission of documents by applicant
2. Review for compliance with the BCBC 2012, ULC S524 standard and Canadian Electrical Code
3. Shop drawings review
4. Periodic Field Reviews (fire separation, fire stopping etc.)
5. Review of Fire Alarm Verification Report
6. Review of Schedule C
7. Review of Demonstration Process submitted by Design Professional (optional)
8. Fire Alarm Demonstration

## The Fire Alarm Demonstration

### 8. Who is typically at a Fire Alarm Demonstration?

- register coordinating professional & design professional (if involved)
- general & electrical contractor
- Fire Alarm Technician (or Electrician) who did the fire alarm installation
- Sprinkler Fitter (if the building is sprinklered)
- City Building, Electrical & Fire Inspectors (as witnesses only to the demonstration)

### 9. Equipment typically supplied by Applicant for the fire alarm demonstration

- ULC approved equipment for activating smoke & heat detectors
- communication radios & other tools & equipment as requested by the City Inspectors

### 10. Typical Full Fire Alarm Demonstration Procedure

1. Initial meet & greet and review procedure & specific individual tasks
2. Live Demonstration of FAS
  - Fire Department Inspector notifies the FD Dispatch of the demonstration
  - A random field device is activated to verify if the Fire Department is notified within 90 seconds by the monitoring agency (a failure of the live test & the demonstration will be halted & will be conducted another day)
3. Off-Line Demonstration of FAS Devices are correctly functioning

#### **Signalling Device Activations**

- manual stations
- fire detectors
- water flow switches
- any supervisory device (tamper devices, air or water pressure loss & power loss)

#### **Responding Device Outputs**

- correct display on the annunciator panel
  - adequate audibility of sirens and visibility of strobes
  - release of electromagnetic locks
  - ancillary devices (such as closing of dampers)
  - ventilation shut down (or exhaust start-up if provided)
  - elevator recall operation & alternate floor recall
  - on power shut down, a transfer of emergency power to the FAS operation
4. Review of voice communication systems
  5. Review of performance of any alternate solution involving the fire alarm system

This procedure will vary from project to project and be adapted to suit the site conditions and equipment being demonstrated.