BC BUILDING CODE INTERPRETATION COMMITTEE

A joint committee with members representing

AIBC, EGBC, BOABC

File No: 18-0063 **INTERPRETATION**

Interpretation Date:	July 21, 2020
Building Code Edition:	BC Building Code 2018
Subject:	Location of Smoke Detectors to Close Smoke Dampers
Keywords:	Smoke detectors, motorized smoke dampers
Building Code Reference(s):	3.1.8.11.(3)

Question:

This project utilizes combination motorized smoke/fire dampers that are located at an air transfer louvre that provides make up air to a corridor from a vertical duct shaft where the make up air fan is located on the roof.

1. Is the most suitable location to install a smoke detector on the ceiling of the corridor within 1.5m of the smoke/fire damper that, when activated, will close the adjacent smoke/fire damper?

2. Is it acceptable to automatically close all smoke/fire dampers upon activation of any fire alarm initiating device (e.g. sprinkler flow, manual pull, fire detectors)?

Interpretation:

1. Yes (although this is the best location, a code change is required)

   Sentence 3.1.8.11.(3) states:

   "Except as required by a smoke control system, smoke dampers and combination smoke/fire dampers shall be configured so as to close automatically upon a signal from an adjacent smoke detector located as described in CAN/ULC-S524, "Installation of Fire Alarm Systems," within 1.5 m horizontally of the duct or air-transfer opening in the fire separation

   a) on both sides of the air-transfer opening, or

   b) in the duct downstream of the smoke damper or combination smoke/fire damper"

Patrick Shek, P.Eng., CP, FEC, Committee Chair

The Intent Statements for Sentence 3.1.8.11.(3) are as follows:

Intent 1:
To limit the probability that smoke dampers or combination smoke/fire dampers will not close when activated by fire conditions, which could lead to the spread of smoke from one fire compartment to another fire compartment through openings in the fire separation between the fire compartments, which could lead to harm to persons in the other fire compartment.

Intent 2:
To prevent the operation of all smoke dampers or combination smoke/fire dampers in a building when only the smoke dampers or combination smoke/fire dampers in a fire compartment, where the fire conditions occur, need to close.

Intent 3:
To prevent the reset of all smoke dampers or combination smoke/fire dampers in a building upon every fire condition.

Since the intent of Sentence 3.1.8.11.(3) is to prevent the movement of smoke from one fire compartment that contains a fire to another fire compartment, the best location for the smoke detector that closes the smoke/fire damper is on one side of the smoke/fire damper on the ceiling of the corridor within 1.5m of the smoke/fire damper. It is not logical to also install a fire damper on the other side of the smoke/fire damper as suggested by Clause 3.1.8.11.(3)(a) because the only place to install it would be within the vertical duct shaft. A smoke detector within the vertical duct shaft could be activated by a fire on multiple floor levels, so it may close the wrong damper.

It could be interpreted that installing the smoke detector on the ceiling of the corridor meets the intent of Clause 3.1.8.11.(3)(b) since it is located downstream of the smoke damper. The only difference is that it is not located within a duct because there is no duct which is downstream of the smoke damper.

The BC Building Code Interpretation Committee has sent a request to NRC to amend the wording of Sentence 3.1.8.11.(3) to allow a single smoke detector on the ceiling of the corridor which is within 1.5m of an air transfer louvre which is connected to a vertical duct shaft.

See diagrams on Page 4.

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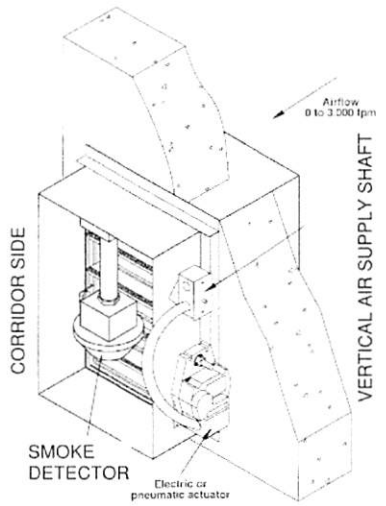
There are smoke/fire dampers that are provided with an integral smoke detector, so those would be another option since they comply with Clause 3.1.8.11.(3)(b) provided that the smoke detector is located on the corridor side of the smoke/fire damper. Note that Sentence 3.1.8.11.(2) allows the combination smoke/fire damper to the offset from the fire separation wall by 610 mm to accommodate the smoke detector on the downstream side of the damper. See illustration below.



2. Yes (in certain circumstances)

   As stated in Intent 2 above, the requirements of Sentence 3.1.8.11.(3) provide the ability to only close smoke/fire dampers that are near to the fire compartment that contains the fire, but does not mandate this as the only mechanism for closing smoke dampers. There may be certain circumstances where the management of smoke movement requires multiple smoke dampers to close simultaneously (e.g. a duct smoke detector near an exterior air intake louvre that detects smoke in the duct that originates from an exterior source).

   Refer also to Interpretation 18-0019 for waiving the requirement for smoke dampers in highrise residential buildings if the vertical shaft is designed as part of a smoke control system.

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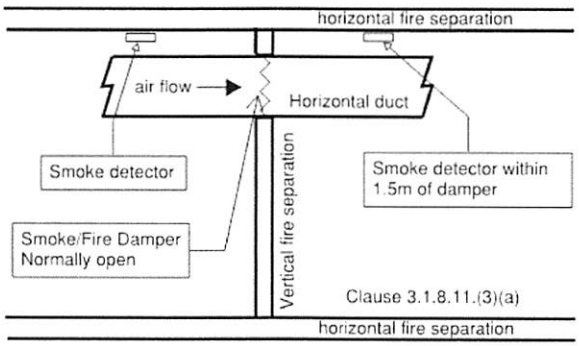

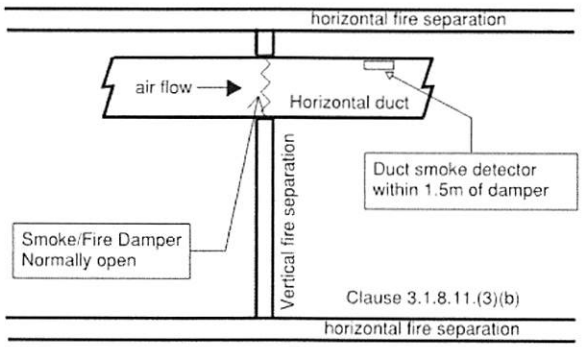

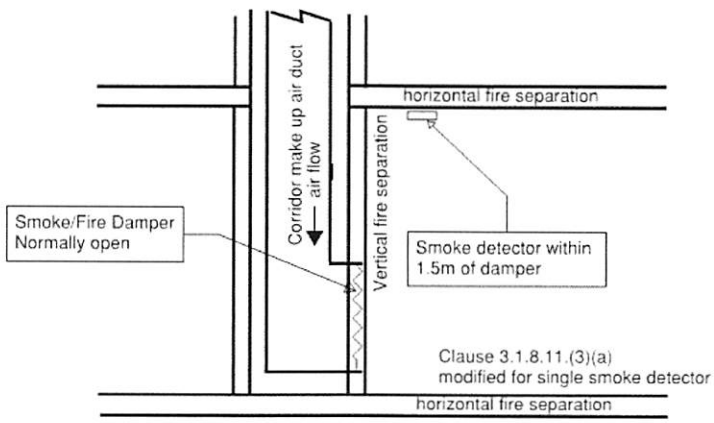

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The views expressed are the consensus of the joint committee with members representing AIBC, EGBC and BOABC, which form the BC Building Code Interpretation Committee. The Building and Safety Standards Branch, Province of BC and the City of Vancouver participate in the committee's proceedings with respect to interpretations of the BC Building Code. The purpose of the committee is to encourage uniform province wide interpretation of the BC Building Code. These views should not be considered as the official interpretation of legislated requirements based on the BC Building Code, as final responsibility for an interpretation rests with the local *Authority Having Jurisdiction*. The views of the joint committee should not be construed as legal advice.

2020-07-22