

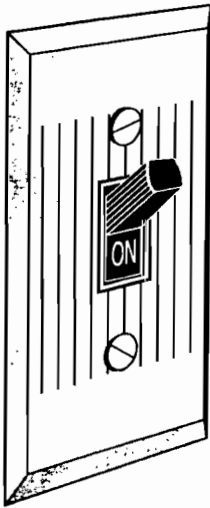
## Residential Ventilation Issues

by Dara Bowser & Bob Allison

### 3-Way or Not 3-Way Switches for Principal Exhaust Fans

*This question is not clear in the Code and the Ministry of Housing has interpreted that 3-way switching can be used when a principal exhaust fan also provides local exhaust from a kitchen or bathroom.*

*Although the authors prefer to agree with the Ministry of Housing, we believe that parallel switching is less costly and more effective.*



VENTILATION FAN

Reviewing the requirements briefly:

- b) The *Principal Ventilation Fan* is required to be controlled by a centrally located on-off switch which is marked "**Ventilation Fan**". A de-humidistat or other automatic control may be used, but it must be in addition to the manual switch. 9.32.3.4.(2),(3),(4)
- c) *Supplemental exhaust fans* are required to be controlled by a manual switch located in the same room as the exhaust air inlet. 9.32.3.5(5)

For the situation which is described explicitly in the Code, this arrangement is quite simple;

- the Principal Ventilation Fan has a wall-switch which turns it on and off, and
- each local Supplemental Fan has an on/off wall switch (separate from the light switch) in the same room as the fan or inlet.

The difficulty arises when a fan located in a kitchen or bathroom is used as the principal exhaust fan. In this case, it is not clear what the switching arrangement should be. The appendix gives no guidance with respect to this, and the ONHWP Redbook, Complying with the Residential Ventilation Requirements of the 1993 Ontario Building Code discusses the use of parallel controls to control a single fan from multiple locations on page D10. The Redbook notes that parallel controls have the disadvantage of requiring that all of the switches be turned to the "off" position before the fan stops. The Redbook does not discuss the possibility of 3-way switch control.

There is a basic difference between 3-way and parallel control wiring in this situation. *3-way wiring tends to lead to intermittent and times uncontrolled operation*, because each switch can turn the fan on or off at any time. Persons using the washroom or kitchen where the fan is located would naturally have a tendency to turn the fan off when they are finished using the room. If someone wished to operate the principal fan on a more-or-less continuous basis, he or she would have to "stand by" the centrally located switch, flipping it on when someone else in the house turned it off. If the fan is located a long ways away from the central switch location and is indeed quiet, then a person would not be able to tell whether the fan was on or off, and so would not know whether or not to flip the switch.

A Field Survey of 24 Homes in June 1994 (see OBOA Journal April '95) recommended that:

*"Information should be provided to New Home Purchasers emphasizing continuous use of exhaust only systems, and consideration should be given to amending the Code to require timers to increase principal fan usage."*

The recommendation was made because of the poor indoor air quality found in many of the exhaust only homes. The poor air quality was attributed to the lack of operation of the principal

ventilation fan in particular. The findings are recommendations of this study are summarized in a two page "Research Brief" which is available from the Ministry of Housing and ONHWP.

Parallel switches tend to encourage continuous operation because all of the switches must be off in order for the fan to be off. If the principal fan switch is set to the "on" position, the fan will stay on until it is turned off, regardless of the actions of the other switches. Additionally, the central fan switch will have "on" and "off" positions which do not change depending on the position of the other switches.

There's one other reason that parallel switches are better than 3-way switches . . . they're less expensive! 3-way switches cost more than the simple light switches that are used for parallel switching. For 3-way switching, 3-conductor wire must be used between the switches, but for parallel, 2-conductor wire is just fine.

If you are in the "3-way" camp, remember that if the fan is central and ducted to serve more than one location, 4-way switches may be required, which are even more costly.

**To Summarize:** The Code itself is not clear as to whether 3-way or parallel switches should be used when a principal exhaust fans controlled from two or more locations. However parallel switching makes good sense because;

- a) it leads to more continuous operation of the fan, which is desirable from an air quality point of view, and
- b) it's less expensive.

## Can You Identify These Directors?



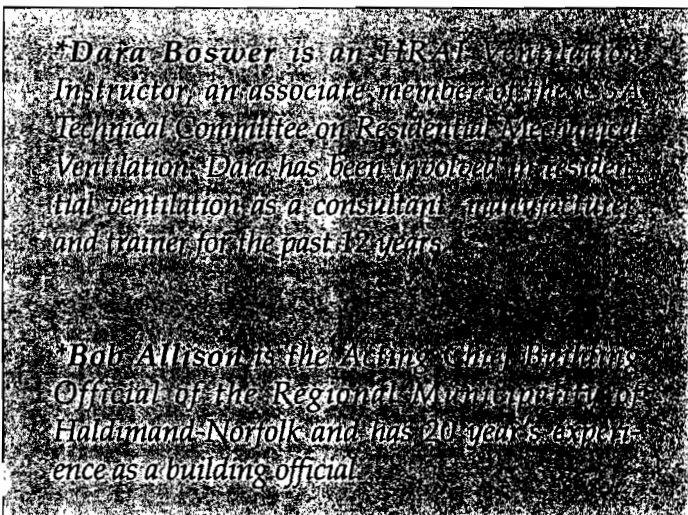
### QUESTION

1. What are their titles and positions and employers?
2. What nickname did the Director on the right receive at the OBOA Annual Meeting in North Bay?

HINT: \_ \_ T \_ \_ S \_ \_ T \_ \_ R

- First 2 (letters only) correct answers to question (1) will receive a L or XL t-shirt.
- Answer both and receive 2 t-shirts from the OBOA head office.

### CROSSWORD PUZZLE ANSWERS



<sup>1</sup> H O T W A T R  
<sup>2</sup> Z E R O N E G A P U B L I C A D L  
<sup>3</sup> M A R Q U E E  
<sup>4</sup> P U B L I C  
<sup>5</sup> P L N U M A L E I G H T N  
<sup>6</sup> E X I S T E N C E P A T I E N T S  
<sup>7</sup> C H A N G E O F U S E  
<sup>8</sup> O  
<sup>9</sup> S H O W E R H E A D S  
<sup>10</sup> F O A M E D  
<sup>11</sup> C E N G  
<sup>12</sup> T  
<sup>13</sup> B E