

## THE 2006 B.C. BUILDING CODE REQUIREMENTS FOR MECHANICAL VENTILATION OF HOUSES

The information listed below is provided to assist owners and builders in clarifying some of the Code requirements for active house ventilation. In all cases the referenced B.C. Building Code (Code) will take precedent (see Code section 9.32. for a full list of requirements). Since this bulletin only highlights some of the Code requirements, it is strongly recommended that owners and builders carefully review relevant portions of the Code prior to choosing the exhaust fan models, CFM ratings and exhaust duct sizes.

Today's houses are built with both an air and vapour barrier. This is most often achieved by wrapping the inside of the exterior walls as well as the ceiling of the upper floor with sheet polyethylene. Since this results in an interior space that is "sealed", the new Code requires that houses be "mechanically ventilated" by means of exhaust fans. The intention of this Code requirement is to ensure that excessive moisture and air pollutants are continuously removed from the house. The Code also requires that there be a dedicated "principal" bathroom fan. This fan must be automatically controlled by a programmable timer switch, which must be set so the principal fan cycles "on" for a minimum of two 4 hour cycles per day. The referenced switch also has a manual override for normal use. Even though one may intuitively see this as a "waste" of energy – running the fan results in a significantly improved environment that is better for both the occupants and the building itself.

Some Code Tables have been attached to this bulletin for reference and convenience (see attached). These tables list the minimum exhaust fan sizes for the required "principal" fan, the minimum required ventilation rates required for other bathroom and kitchen fans as well as the minimum exhaust duct sizes. Special attention is required where any single fan is capable of exhausting more than one half the interior volume of air in a house in one hour (typically these fans are limited to medium to large volume kitchen exhaust fans).

**IF YOU WILL HAVE THIS SCENARIO – PLEASE SPEAK TO THE BUILDING INSPECTOR PRIOR TO INSTALLATION.**

**Table 9.32.3.3.A – Principal Exhaust Fan Ventilation Rate.** This table lists the "*minimum*" required ventilation rate in Litres per Second (l/s) for the principal fan in bathrooms. Cubic Feet per Minute (CFM) are also shown on the attached tables. Every new house requires a dedicated "Principal Exhaust Fan" with a programmable timer set for two four hour cycles per day.

**Table 9.32.3.3.B – Minimum Bathroom & Kitchen Exhaust Ventilation Rate.** This table lists the "*smallest*" fan that would comply with the Code for bathrooms (bathrooms other than the one containing the principal exhaust fan). All bathrooms require a fan – a window alone will no longer satisfy the Code for required ventilation. Example: The minimum sized bathroom exhaust fan (other than the dedicated principle fan) in a house is 25 l/s (50 CFM).

**Table 9.32.3.39. – Minimum Exhaust Duct Size Required for Wall or Ceiling Exhaust Duct.** This table lists the "*smallest*" smooth or flexible duct size that would comply with the Code. It is important that one uses the actual l/s or CFM of the fan you are intending to use to select the corresponding duct size listed in the table. It is very common for new houses to have bathroom fans rated to exhaust 65 l/s or 100 CFM. This larger size fan, according to the table, would require a 6" smooth duct or a 7" flexible duct.

The appropriate and attached (A, B or C) **MECHANICAL VENTILATION CHECKLIST** must be completed and submitted to North Saanich at or before the frame inspection. The reference to a "N.A.F.F.V.A." on the checklist refers to an appliance that has a flue or chimney that carries hot gases away from the structure – "N.A.F.F.V.A." means naturally aspirating fuel fired vented appliance. An example of a N.A.F.F.V.A. is a wood burning fireplace and chimney that takes carbon monoxide and other gases up a chimney. Where a house has a "N.A.F.F.V.A." and an exhaust appliance capable of exhausting more than one half the interior volume of air in a house in one hour, caution and investigation are required prior to any installations. An active make-up air system will be required. Since this bulletin only highlights some of the Code requirements, it is strongly recommended that owners consult with a contractor familiar with all of Code Section 9.32. When a house has any fuel fired appliance and/or an attached garage, the Code requires carbon monoxide alarms installed to Code spec's.

North Saanich Building Inspectors are available to assist in explaining the Code requirements for ventilation. The office number is 250-655-5470.

# A

## Mechanical Ventilation Checklist A — Non-Distributed

Use this checklist with **Non-Distributed Systems** such as those usually found in dwellings with **electric or hot water radiant or baseboard heating systems** or where duct systems do not distribute ventilation air.

Civic Address _____	Permit No. _____
Number of Bedrooms <input style="width: 80px;" type="text"/>	(A)
Total Interior Volume of Dwelling <input style="width: 80px;" type="text"/> ft <sup>3</sup>	Total volume includes heated interior joist spaces and heated crawlspaces.
.5 ACH (air changes/hr) = Volume x 0.5 ÷ 60 = <input style="width: 80px;" type="text"/> cfm	(B) Exhaust appliances exceeding .5 ACH may require make-up air.

### 1. Principal Fan

a) **Exhaust Rate:** Use the bedroom count from Box (A) above and Table 9.32.3.3.A. to determine Minimum Rate. Maximum Rate of 110 cfm if NAFFVA/Radon present.

The Principal Exhaust Fan will be controlled automatically with an interval timer OR run continuously.

Minimum required rate: **Interval Timer**

cfm (C)

**Continuous**

cfm (D)

### b) Principal Fan CFM & Sone Rating:

Make \_\_\_\_\_ Model \_\_\_\_\_

cfm (E)

Sones: Interval \_\_\_\_\_ Continuous \_\_\_\_\_  
 Maximum rating: Interval Timer 1.5 Sones Continuous 1 Sone

Box E Maximum allowed is **110 cfm** if Make-up Air Required in Step 4.

Fan Location: \_\_\_\_\_

c) **Principal Fan Duct Size:** Use actual fan cfm in Box E above and Table 9.32.3.9.

Fan Duct size: \_\_\_\_\_ inches. Duct type: \_\_\_ Smooth \_\_\_ Flex

### 2. Required Kitchen and Bathroom Exhaust Fans:

Room	Fan Make & Model	Fan CFM		Duct Diameter (in)	
		Code Req'd Min @ 2"W.C. per Table 9.32.3.3.B	actual Fan CFM @ 2"W.C. per Manf. Rating	Table 9.32.3.9*	
				Smooth	Flex

\* For fan capacities exceeding Table 9.32.3.9, follow manufacturer's installation instructions or use good engineering practice to size duct. See *Ventilation Guidelines* Appendix page 24-A.

3. NAFFVA (Naturally Aspirated Fuel Fired Vented Appliance) and/or Radon Gas present in dwelling unit?

Yes, Proceed to Step 4 & 5

No, Omit Steps 4 to 7.

4. Passive Make-Up Air Duct for Principal Fan: Use the Box E installed cfm and Table 9.32.3.8.

Make-up air duct diameter \_\_\_\_\_ inches. Location \_\_\_\_\_

5. Exhaust Appliance present which exceeds Box B 0.5 ACH:

Yes, Proceed to Step 6.

No such appliance. Omit Steps 6 to 7.

6. Use Passive Make-up Air for Exhaust Appliance with actual installed exhaust rate of 126 cfm or less:

Appliance Cfm \_\_\_\_\_ Passive Make-up Air Duct Sized to Table 9.32.3.8: \_\_\_\_\_ inches

7. Use Active Make-up Air for Exhaust Appliance with actual installed exhaust rate of more than 126 cfm.

Make-up Air Fan required:

\*Exhaust Appliance Cfm \_\_\_\_\_

Fan Make \_\_\_\_\_ Model \_\_\_\_\_

Fan Cfm \_\_\_\_\_

Duct diameter \_\_\_\_\_ inches

\*Must equal actual installed exhaust rate of appliance.

Fan Location \_\_\_\_\_ Fan ducted to \_\_\_\_\_

A) Active Make-up Air delivered to an Unoccupied Area (not directly to room containing the appliance).

Tempering Required per 9.32.4.1.(4)(a):

Show calculation & describe how make-up air will be tempered to at least 34°F (1°C) before entering unoccupied area.

Transfer Grill Required: Size to Table 9.32.3.8 (or 1 sq in of gross area per 2 cfm):

Transfer grill size \_\_\_\_\_ sq. in. Location \_\_\_\_\_

Additional Tempering Required per 9.32.4.1.(4)(b) before transfer to occupied area: Show calculation and describe how make-up air will be further tempered to at least 54°F (12°C).

B) Active Make-up Air delivered to an Occupied Area: Tempering Required. Show calculation and describe

how make-up air will be tempered to at least 54°F (12°C).

**Installer Certification:**

Date \_\_\_\_\_

I hereby certify that the design and installation of the ventilation system complies with the 2006 B.C. Building Code.

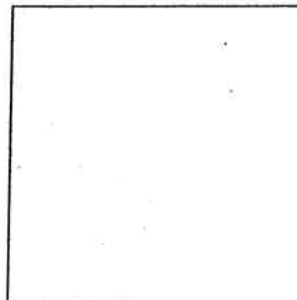
Print Name \_\_\_\_\_

2006 TECA Ventilation Certification Stamp

Signature \_\_\_\_\_

Company \_\_\_\_\_

Phone \_\_\_\_\_



Checklist A2

# B

## Mechanical Ventilation Checklist B—Distributed

Previously Checklist C (per former 1998 BCBC)

This Checklist is for use with **forced air heating systems** where the heating duct system distributes ventilation air.

Civic Address _____		Permit No. _____	
Number of Bedrooms		(A)	A bedroom is a room with an openable window (minimum dimensions apply), a closet and a closing interior door.
Total Interior Volume of Dwelling		ft <sup>3</sup>	Total volume includes heated interior joist spaces and heated crawlspaces.
.5 ACH (air changes/hr) = Volume x 0.5 ÷ 60 =		cfm	(B)
Exhaust appliances exceeding .5 ACH may require make-up air.			

### 1. Principal Fan

a) **Exhaust Rate:** Use the bedroom count from Box (A) above and Table 9.32.3.3.A. to determine Minimum Rate. (Maximum Rate of 110 cfm if NAFFVA/Radon present.)

Minimum required rate: **Interval Timer**

**Continuous**

\_\_\_\_\_ cfm (C)

\_\_\_\_\_ cfm (D)

b) **Principal Fan CFM & Sone Rating:**

Make \_\_\_\_\_ Model \_\_\_\_\_

\_\_\_\_\_ cfm (E)

**Sones: Interval** \_\_\_\_\_  
Maximum allowed: Interval timer 1.5 sones

**Continuous** \_\_\_\_\_  
Continuous 1 sone

Box E Maximum allowed is **110 cfm** if Make-up Air Required in Step 4.

Fan Location: \_\_\_\_\_

c) **Principal Fan Duct Size:** Use actual fan cfm in Box E above and Table 9.32.3.9 for Duct.

Fan Duct size: \_\_\_\_\_ inches. Duct type: \_\_\_ Smooth \_\_\_ Flex

### 2. Required Kitchen and Bathroom Exhaust Fans:

Room	Fan Make & Model	Fan CFM		Duct Diameter (in)	
		Code Req'd Min @ 2"W.C. per Table 9.32.3.3.B	actual Fan CFM @ 2"W.C. per Manf. Rating	Table 9.32.3.9*	
				Smooth	Flex

\* For fan capacities **exceeding** Table 9.32.3.9, follow manufacturer's installation instructions or use good engineering practice to size duct. See *Ventilation Guidelines* Appendix page 24-A.

Checklist B1

**3. NAFFVA (Naturally Aspirated Fuel Fired Vented Appliance) and/or Radon Gas present in dwelling unit?**

Yes, Proceed to Step 4 & 5

No, Omit Steps 4 to 7.

**4. Active Make-Up Air Duct for Principal Fan: Per Sec 9.32.3.8. (2) (b) (ii & iii)** Install a 4"Ø outdoor air duct into the furnace return air plenum not more than 15ft (unless a flow control device is used) or less than 10ft from the furnace cabinet. In locations with winter design temperature less than -10° C, this duct must have a motorized damper inter-connected with principal ventilation air fan. **Interconnect in place:** Principal Fan & Furnace Blower  Yes & Damper (if present)  Yes

Damper make \_\_\_\_\_ Voltage \_\_\_\_\_

**5. Exhaust Appliance present which exceeds Box B 0.5 ACH:**

Yes, Proceed to Step 6.

No such appliance. Omit Steps 6 to 7.

**6. Use Passive Make-up Air for Exhaust Appliance with actual installed exhaust rate of 126 cfm or less:**

Appliance Cfm \_\_\_\_\_ Passive Make-up Air Duct Sized to Table 9.32.3.8: \_\_\_\_\_ inches

**7. Use Active Make-up Air for Exhaust Appliance with actual installed exhaust rate of more than 126 cfm.**

**Make-up Air Fan required:**

**\*Exhaust Appliance Cfm** \_\_\_\_\_

Fan Make \_\_\_\_\_ Model \_\_\_\_\_

**Fan Cfm** \_\_\_\_\_

Duct diameter \_\_\_\_\_ inches

\*must equal actual installed exhaust rate of appliance.

Fan Location \_\_\_\_\_ Fan ducted to \_\_\_\_\_

**a) Active Make-up Air delivered to an Unoccupied Area (not directly to room containing the appliance).**

**i) Tempering Required per 9.32.4.1.(4)(a):**

Show calculation & describe how make-up air will be tempered to at least 34°F (1°C) before entering unoccupied area.

**ii) Transfer Grill Required: Size to Table 9.32.3.8 (or 1 sq in of gross area per 2 cfm):**

Transfer grill size \_\_\_\_\_ sq. in. Location \_\_\_\_\_

**iii) Additional Tempering Required per 9.32.4.1.(4)(b) before transfer to occupied area: Show calculation and describe how make-up air will be further tempered to at least 54°F (12°C).**

**OR b) Active Make-up Air delivered to an Occupied Area: Tempering Required. Show calculation and describe how make-up air will be tempered to at least 54°F (12°C).**

**Installer Certification:**

Date \_\_\_\_\_

I hereby certify that the design and installation of the ventilation system complies with the 2006 B.C. Building Code.

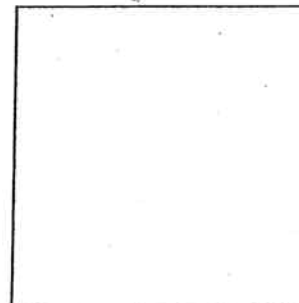
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**2006 TECA Ventilation Certification Stamp**

Signature \_\_\_\_\_

Company \_\_\_\_\_

Phone \_\_\_\_\_



Checklist B2



5. **NAFFVA** (Naturally Aspirated Fuel Fired Vented Appliance) **and/or Radon Gas present in dwelling unit?**

Yes, Proceed to Step 6 if CEV or Step 7 if HRV.  No, Omit Steps 6 to 9.

6. **CEV only—Make-Up Air Duct for Principal Fan: Choose (a) or (b) and proceed to Step 7.**

a) **Non-Distributed system—Passive make-up air duct:** Use Box E or F installed cfm and Table 9.32.3.8.

Make-up air duct diameter \_\_\_\_\_ inches. Location \_\_\_\_\_

b) **Distributed system—Active Make-Up Air Duct for Principal Fan: Per Sec 9.32.3.8. (2) (b) (ii & iii)**

Install a 4"Ø outdoor air duct into the furnace return air plenum not more than 15ft (unless a flow control device is used) or less than 10ft from the furnace cabinet. In locations with winter design temperature less than -10° C, this duct must have a motorized damper interconnected with principal ventilation air fan.

Interconnect in place: Principal Fan & Furnace Blower  Yes  
Damper make \_\_\_\_\_ Voltage \_\_\_\_\_ & Damper (if present)  Yes

7. **Exhaust Appliance present which exceeds Box B —0.5 ACH:**

Yes, Proceed to Step 8.  No such appliance. Omit Steps 8 to 9.

8. Use **Passive Make-up Air** for Exhaust Appliance with actual installed exhaust rate of **126 cfm or less:**

Appliance Cfm \_\_\_\_\_ Passive Make-up Air Duct Sized to Table 9.32.3.8: \_\_\_\_\_ inches

9. Use **Active Make-up Air** for Exhaust Appliance with actual installed exhaust rate of **more than 126 cfm.**

**Make-up Air Fan required:**

Fan Make \_\_\_\_\_ Model \_\_\_\_\_

**\*Exhaust Appliance Cfm \_\_\_\_\_**

Duct diameter \_\_\_\_\_ inches

**Fan Cfm \_\_\_\_\_**

\*must equal actual installed exhaust rate of appliance.

Fan Location \_\_\_\_\_ Fan ducted to \_\_\_\_\_

a) **Active Make-up Air delivered to an Unoccupied Area** (not directly to room containing the appliance).

i) **Tempering Required per 9.32.4.1.(4)(a):**

Show calculation & describe how make-up air will be tempered to at least 34°F (1°C) before entering unoccupied area.

ii) **Transfer Grill Required: Size to Table 9.32.3.8 (or 1 sq in of gross area per 2 cfm):**

Transfer grill size \_\_\_\_\_ sq. in. Location \_\_\_\_\_

iii) **Additional Tempering Required per 9.32.4.1.(4)(b) before transfer to occupied area:** Show calculation and describe how make-up air will be further tempered to at least 54°F (12°C).

**OR b) Active Make-up Air delivered to an Occupied Area: Tempering Required.** Show calculation and describe how make-up air will be tempered to at least 54°F (12°C).

**Installer Certification:**

Date \_\_\_\_\_

I hereby certify that the design and installation of the ventilation system complies with the 2006 B.C. Building Code.

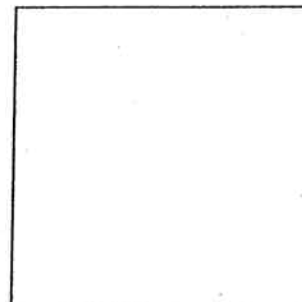
Print Name \_\_\_\_\_

2006 TECA Ventilation Certification Stamp

Signature \_\_\_\_\_

Company \_\_\_\_\_

Phone \_\_\_\_\_



Checklist C2

<b>Table 9.32.3.3.A</b>			
<b>Principal Exhaust Fan Ventilation Rate</b>			
<b>Forming Part of Clause 9.32.3.3(1)(a)</b>			
<b>Number of Bedrooms</b>	<b>Minimum Ventilation Rate</b>		
	<b>l/s</b>		<b>CFM</b>
1	15		30
2	22		45
3	30		60
4 or more	35		75

**Notes to Table 9.32.3.3.A**

A bedroom is considered a room with a window conforming to Article 9.7.1.3., a closet, and an interior closing door.

<b>Table 9.32.3.3.B</b>			
<b>Bathroom/Kitchen Exhaust Ventilation Rate</b>			
<b>Forming Part of Clause 9.32.3.3(1)(b)</b>			
<b>Room</b>	<b>Exhaust Rate l/s</b>		
	<b>Intermittent</b>		<b>Continuous</b>
	<b>l/s</b>	<b>CFM</b>	<b>l/s</b>
Kitchen	40	80	N/A
Bathroom	25	50	10

<b>Table 9.32.3.9.</b>					
<b>Minimum Exhaust Duct Size</b>					
<b>Required for a Wall or Ceiling Exhaust Fan</b>					
<b>Forming Part of Article 9.32.3.9.</b>					
<b>Maximum Exhaust Fan</b>		<b>Minimum Ventilation Rate</b>			
<b>Ventilation Rate</b>		<b>Smooth Duct</b>		<b>Flexible Duct</b>	
<b>l/s</b>	<b>CFM</b>	<b>mm</b>	<b>inches</b>	<b>mm</b>	<b>inches</b>
10	21	75	3	100	4
25	53	100	4	125	5
45	95	125	5	150	6
70	126	150	6	175	7