City of Richmond

Ventilation
Building Approvals Department
6911 No. 3 Road, Richmond, BC V6Y 2C1

www.richmond.ca

Section 9.32

The BC Building Code, Section 9.32 requires that a contractor building a new home must install a ventilating system with a proven capacity. The system must have an ability to provide a complete air change in a house within two hours. The system must be rated and installed to deliver the actual amount of air that is necessary to ventilate the structure.

Good ventilating requires a system that will provide fresh air to a home on a continuing basis. This is particularly important in homes with open fireplaces and unsealed furnaces. Stale air is extracted from certain rooms such as kitchens and bathrooms, by the use of humidity-control extraction outlets. This ensures the removal of odours and other pollutants in the air, as well as excess moisture. Without proper ventilation, there can be a heavy accumulation of polluted air. With modern construction methods, most new homes today are more air-tight than before and there is less natural circulation of air than there used to be.

Enclosed is a set of Mechanical Ventilation Checklists which have been developed by TECA for the convenience of the residential construction industry. The main purpose of the checklists is to ensure that Municipal Building Departments are provided with the required ventilation information. It is intended that these checklists will provide a high level of consistency on Code interpretation throughout the Lower Mainland.

For those interested, additional training and certification is available to the industry through the TECA (telephone 1-888-577-3818). Please contact this division for copies of the forms. Building Inspectors will be pleased to answer questions or provide further clarification.

TECA (Thermal Environmental Comfort Association)

1 Ventilation Checklist 1—Forced Air Systems SENTENCE 9.32.3.4(6)

Use this Checklist where **forced air heating system ducts intake and distribute** ventilation air.

Civic Address_____ Permit No._____

Climate Zone: ____ Number of Bedrooms [ ] (A) A bedroom is a room with an openable window (minimum dimensions apply), a closet and a closing interior door.

Total Floor area of conditioned space [ ] ft^2 (B)

Total Interior Volume of Dwelling [ ] ft^3 Total volume includes all heated interior spaces

.5 ACH (air changes/hr) = Volume x 0.5 ÷ 60 = [ ] cfm (C) Exhaust appliances exceeding .5 ACH may require make-up air.

1. Principal Ventilation System Exhaust Fan Minimum Air-flow Rate

Use the bedroom count from Box (A) and Total square footage from Box (B) above and Table 9.32.3.5. to determine

Minimum Required Prinicpal Exhaust System Capacity [ ] cfm (D)

2. Principal System Fan Choice

a) Exhaust Fan continuous running Make_____Model_____ Sone Rating ____

Location: _____ **Capacity at 0.2 ESP** [ ] cfm (E) Must be ≥ than Box (D)

If CEV, capacity @0.4ESP

3. Fan Duct Size and Equivalent Length

Use actual fan cfm in Box(E) above and Table 9.32.3.8 (3) [See note at bottom of page for larger fan duct sizing].

a) Length of duct_____ft + Exterior hood 30ft + number of 90° elbows ____X 10 ft = _____**Equivalent Length**

Maximum Equivalent Length allowed in Table 9.32.3.8(3) = _____

b) Fan Duct size: _____inches Ø Duct type: ___Rigid ___Flex

4. Required Kitchen and Bathroom Exhaust Fans: Re-list below if Principal Exhaust Fan meets all or part of Kitchen/Bathroom spot Exhaust requirements.

ROOM	REQUIRED EXHAUST RATE **Table 9.32.3.6**	EXHAUST EQUIPMENT						
		Spot Exhaust Kitchen & Bath WALL/CEILING FANS						Ex.Fan/CEV
		Fan Make & Model	CFM @ 0.2 ESP Manf. Rated	*Duct Sizing per Table 9.32.3.8.(3)				Principal System CFM
				Duct Dia (in Ø)		Max. Equiv. Length per table	Installed Equiv. Length	
				rigid	flex			

TOTAL (must = Box E) [ ]

* For fan capacities **exceeding** 175cfm in Table 9.32.3.8(3), follow manufacturer's installation instructions or use good engineering practice to size duct.

See *Ventilation Guidelines* Appendix page 16-A

Checklist 1, pg1of2

5. Fresh Air must be ducted from outside to Return Air of furnace for distribution.

a) Duct length from this connection to furnace cabinet must be 15 ft maximum and 10 ft minimum unless a flow control device is used. Duct length confirmed at _____ feet.

b) Duct Size for Fresh Air intake to RA:

4" Ø minimum for Rigid Duct. Must be insulated & vapour barriered for full length. ___ confirmed.

5"Ø minimum for insulated, vapour barriered Flex Duct ___ confirmed.

6. Forced Air Furnace system ducted to supply air to every bedroom and any level without a bedroom___ confirmed.

7. If Heated Crawlspace present, state method of ventilating_____

MAKE-UP AIR Requirements

1. NAFFVA (Naturally Aspirated Fuel Fired Vented Appliance) **or radon present in dwelling unit? Sentence 9.32.4.1**

☐ **Yes, Proceed to Step 2** ☐ **No**, Omit Steps 2 & 3

2. Exhaust Appliance present which exceeds Box C 0.5 ACH:

☐ **Yes, Proceed to Step 3** ☐ **Yes, Commit to Depressurization Test** (See **CAUTION**, TECA Vent Manual pg 24) ☐ **No such appliance**. Omit Step 3

3. Use Active Make-up Air for Exhaust Appliance.

Make-up Air Fan required: **Exhaust Appliance Actual Installed Cfm** _____

Fan Make _____ Model _____ **Make-up Air Fan Cfm** _____

Duct diameter _____inches

Fan Location _____ Fan ducted to _____

a) Active Make-up Air delivered to an Unoccupied Area first (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 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 2012 B.C. Building Code, 2014 Section 9.32 Amendment.

2014 TECA Ventilation Certification Stamp

Print Name_____

Signature_____

Company_____

Phone _____

2 Ventilation Checklist 2—HRV Systems SENTENCE 9.32.3.4 (3) & (4)

Use this checklist when a centrally ducted HRV (heat recovery ventilator) is used alone or in combination with a Forced Air furnace to meet principal ventilation system requirements.

Civic Address_____ Permit No._____

Climate Zone: ____ Number of Bedrooms _____ (A) A bedroom is a room with an openable window (minimum dimensions apply), a closet and a closing interior door.

Total Floor area of conditioned space _____ ft^2 (B)

Total Interior Volume of Dwelling _____ ft^3 Total volume includes all heated interior spaces

.5 ACH (air changes/hr) = Volume x 0.5 ÷ 60 = _____ cfm (C) Exhaust appliances exceeding .5 ACH may require make-up air.

1. Use the bedroom count (Box A above) and total square footage (Box B above) to determine the minimum principal Air Flow rate required by Table 9.32.3.5

Minimum Required Rate _____ cfm (D)

2. HRV Make _____ Model _____

3. HRV Capacity: CFM @ 0.4 ESP. Box E must meet Box D requirement. _____ cfm (E)

4. List Exhaust Grilles Locations: 1 minimum @ 6ft or higher from floor of uppermost level.

_____

_____

_____

5. Required Kitchen and Bathroom Exhaust

If HRV used to meet all or part of Kitchen/Bathroom spot exhuast requirements list below.

ROOM	REQUIRED EXHAUST RATE **Table 9.32.3.6**	EXHAUST EQUIPMENT						
		Spot Exhaust Kitchen & Bath WALL/CEILING FANS						HRV
		Fan Make & Model	CFM @ 0.2 ESP Manf. Rated	*Duct Sizing per Table 9.32.3.8.(3)				Principal System CFM
				Duct Dia (in Ø) rigid	Duct Dia (in Ø) flex	Max. Equiv. Length per table	Installed Equiv. Length	
							TOTAL (must = Box E)	

* For fan capacities **exceeding** 175cfm in Table 9.32.3.8(3), follow manufacturer's installation instructions or use good engineering practice to size duct.

See *Ventilation Guidelines* Appendix page 16-A

6. HRV Fresh Air Distribution (choose A or B option)

A) Supply Air from HRV direct connect to Return Air of a Forced Air Furnace system:
Furnace Fan continuous operation: yes ☐ and Forced Air system ducted to supply air to every bedroom and any level without a bedroom: yes ☐ and heated crawlsapce: yes ☐

B) Supply Air from HRV distrubuted independently to every bedroom and any level without a bedroom and to a heated crawlspace. **List distribution grille locations:** _____

_____

_____

MAKE-UP AIR Requirements

1. NAFFVA (Naturally Aspirated Fuel Fired Vented Appliance) **or radon present in dwelling unit? Sentence 9.32.4.1**

☐ **Yes, Proceed to Step 2** ☐ **No**, Omit Steps 2 & 3

2. Exhaust Appliance present which exceeds Box C 0.5 ACH:

☐ **Yes, Proceed to Step 3** ☐ **Yes, Commit to Depressurization Test** (See **CAUTION**, TECA Vent Manual pg 24) ☐ **No such appliance**. Omit Step 3

3. Use Active Make-up Air for Exhaust Appliance.

Make-up Air Fan required: **Exhaust Appliance Actual Installed Cfm** _____

Fan Make _____ Model _____ **Make-up Air Fan Cfm** _____

Duct diameter _____inches

Fan Location _____ Fan ducted to _____

a) Active Make-up Air delivered to an Unoccupied Area first (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 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 _____

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Phone _____

Checklist 2, pg2of2

3 Ventilation Checklist 3—Distributed CRV Systems SENTENCE 9.32.3.4(5)

Use this Checklist when a ducted Central Recirculating Ventilator (CRV) is used to meet the fresh air intake and distribution requirements and a Principal Exhaust fan meets the exhaust requirements.

Civic Address_____ Permit No._____

Climate Zone: ____ Number of Bedrooms _____ (A) A bedroom is a room with an openable window (minimum dimensions apply), a closet and a closing interior door.

Total Floor area of conditioned space _____ ft^2 (B)

Total Interior Volume of Dwelling _____ ft^3 Total volume includes all heated interior spaces

.5 ACH (air changes/hr) = Volume x 0.5 ÷ 60 = _____ cfm (C) Exhaust appliances exceeding .5 ACH may require make-up air.

1. Principal Ventilation System Exhaust Fan Minimum Air-flow Rate

Use the bedroom count from Box (A) and Total square footage from Box (B) above and Table 9.32.3.5. to determine

Minimum Required Prinicpal Exhaust System Capacity _____ cfm (D)

2. Principal System Fan Choice

a) Exhaust Fan continuous running Make_____Model_____ Sone Rating ____

Location: _____ **Capacity at 0.2 ESP** _____ cfm (E) Must be ≥ than Box (D)

Must be ≥ than Box (D)

If CEV, capacity @0.4ESP

3. Fan Duct Size and Equivalent Length

Use actual fan cfm in Box(E) above and Table 9.32.3.8 (3) [See note at bottom of page for larger fan duct sizing].

a) Length of duct_____ft + Exterior hood 30ft + number of 90° elbows ____X 10 ft = _____**Equivalent Length**

Maximum Equivalent Length allowed in Table 9.32.3.8(3) = _____

b) Fan Duct size: _____inches Ø Duct type:___Smooth___Flex

4. Required Kitchen and Bathroom Exhaust Fans: Re-list below if Principal Exhaust Fan meets all or part of Kitchen/Bathroom spot Exhaust requirements.

ROOM	REQUIRED EXHAUST RATE **Table 9.32.3.6**	EXHAUST EQUIPMENT						
		Spot Exhaust Kitchen & Bath WALL/CEILING FANS						Ex.Fan/CEV
		Fan Make & Model	CFM @ 0.2 ESP Manf. Rated	*Duct Sizing per Table 9.32.3.8.(3)				Principal System CFM
				Duct Dia (in Ø) rigid	Duct Dia (in Ø) flex	Max. Equiv. Length per table	Installed Equiv. Length	

TOTAL (must = Box E) _____

* For fan capacities **exceeding** 175cfm in Table 9.32.3.8(3), follow manufacturer's installation instructions or use good engineering practice to size duct.

See *Ventilation Guidelines* Appendix page 16-A

5. CRV Recirculation and Fresh Air Intake Fan

Make_____ Model_____ **Capacity @ 0.4 ESP** _____ cfm (F)

Box F CFM: minimum 2 times Box D cfm for +5°F and warmer winter design temperature. Confirmed ☐
minimum 3 times Box D for less than +5°F winter design temperature. Confirmed ☐

Duct Size for Fresh Air intake into return air of CRV: Min 4"Ø rigid duct___, or 5", flex duct_____.

6. CRV Fresh Air circulation (Choose option a or b)

a) Draw air from bedrooms and Supply air to common area.
List location of supply grille _____ and location of each bedroom return grille

_____

b) Draw air from common area and Supply air to bedrooms.
List location of return grille _____ and location of each bedroom supply grille

_____

_____

7. If Heated Crawlspace present, state method of ventilating_____

MAKE-UP AIR Requirements

1. NAFFVA (Naturally Aspirated Fuel Fired Vented Appliance) **or radon present in dwelling unit? Sentence 9.32.4.1**

☐ **Yes, Proceed to Step 2** ☐ **No**, Omit Steps 2 & 3

2. Exhaust Appliance present which exceeds Box C 0.5 ACH:

☐ **Yes, Proceed to Step 3** ☐ **Yes, Commit to Depressurization Test** (See **CAUTION**, TECA Vent Manual pg 24) ☐ **No such appliance**. Omit Step 3

3. Use Active Make-up Air for Exhaust Appliance.

Make-up Air Fan required: **Exhaust Appliance Actual Installed Cfm** _____

Fan Make _____ Model _____ **Make-up Air Fan Cfm** _____

Duct diameter _____inches

Fan Location _____ Fan ducted to _____

a) Active Make-up Air delivered to an Unoccupied Area first (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 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 2012 B.C. Building Code, 2014 Section 9.32 Amendment.

2014 TECA Ventilation Certification Stamp

Print Name_____

Signature_____

Company_____

Phone _____

Checklist 3, pg2of2

4 Ventilation Checklist 4—Exhaust Fan & Passive Inlets SENTENCE 9.32.3.4(6)

Use this checklist for small (≤ 1800 sqft), single level, non-forced air heated dwellings located in coastal climate areas where winter design temperature is warmer than -13°F.

Civic Address_____ Permit No._____

Climate Zone: ____ Number of Bedrooms [ ] (A) A bedroom is a room with an openable window (minimum dimensions apply), a closet and a closing interior door.

Total Floor area of conditioned space [ ] ft^2 (B)

Total Interior Volume of Dwelling [ ] ft^3 Total volume includes all heated interior spaces

.5 ACH (air changes/hr) = Volume x 0.5 ÷ 60 = [ ] cfm (C) Exhaust appliances exceeding .5 ACH may require make-up air.

1. Principal Ventilation System Exhaust Fan Minimum Air-flow Rate

Use the bedroom count from Box (A) and Total square footage from Box (B) above and Table 9.32.3.5. to determine

Minimum Required Prinicpal Exhaust System Capacity [ ] cfm (D)

2. Principal System Fan Choice

a) Exhaust Fan continuous running Make_____Model_____ Sone Rating ____

Location: _____ **Capacity at 0.2 ESP** [ ] cfm (E) Must be ≥ than Box (D)

If CEV, capacity @0.4ESP

3. Fan Duct Size and Equivalent Length

Use actual fan cfm in Box(E) above and Table 9.32.3.8 (3) [See note at bottom of page for larger fan duct sizing].

a) Length of duct_____ft + Exterior hood 30ft + number of 90° elbows ____X 10 ft = _____**Equivalent Length**

Maximum Equivalent Length allowed in Table 9.32.3.8(3) = _____

b) Fan Duct size: _____inches Ø Duct type:___Smooth___Flex

4. Required Kitchen and Bathroom Exhaust Fans: Re-list below if Principal Exhaust Fan meets all or part of Kitchen/Bathroom spot Exhaust requirements.

ROOM	REQUIRED EXHAUST RATE **Table 9.32.3.6**	EXHAUST EQUIPMENT						
		Spot Exhaust Kitchen & Bath WALL/CEILING FANS						Ex.Fan/CEV
		Fan Make & Model	CFM @ 0.2 ESP Manf. Rated	*Duct Sizing per Table 9.32.3.8.(3)				Principal System CFM
				Duct Dia (in Ø) rigid	Duct Dia (in Ø) flex	Max. Equiv. Length per table	Installed Equiv. Length	

TOTAL (must = Box E) [ ]

* For fan capacities **exceeding** 175cfm in Table 9.32.3.8(3), follow manufacturer's installation instructions or use good engineering practice to size duct.

See *Ventilation Guidelines* Appendix page 16-A

5. Required Inlets for passive Ventilation Air Supply

a) Location: High wall (minimum 6 ft above floor) ____

List all rooms with inlets: Required in each bedroom, and at least one common area

_____

_____

b) Inlet Size: Free Area must be greater than or equal to 4 Sq In

6. If Heated Crawlspace present, state method of ventilating_____

MAKE-UP AIR Requirements

1. NAFFVA (Naturally Aspirated Fuel Fired Vented Appliance) **or radon present in dwelling unit? Sentence 9.32.4.1**

☐ **Yes, Proceed to Step 2** ☐ **No**, Omit Steps 2 & 3

2. Exhaust Appliance present which exceeds Box C 0.5 ACH:

☐ **Yes, Proceed to Step 3** ☐ **Yes, Commit to Depressurization Test** (See **CAUTION**, TECA Vent Manual pg 24) ☐ **No such appliance**. Omit Step 3

3. Use Active Make-up Air for Exhaust Appliance.

Make-up Air Fan required: **Exhaust Appliance Actual Installed Cfm** _____

Fan Make _____ Model _____ **Make-up Air Fan Cfm** _____

Duct diameter _____inches

Fan Location _____ Fan ducted to _____

a) Active Make-up Air delivered to an Unoccupied Area first (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 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 _____

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2014 TECA Ventilation Certification Stamp

Print Name_____

Signature_____

Company_____

Phone _____

Checklist 4, pg2 of 2