APPENDIX A — DIVISION B
EXPLANATORY MATERIAL

A-9.32.3. Heating-Season (Mechanical) Ventilation. While ventilation strategies can have a significant impact on energy performance, ventilation is primarily a health and safety issue. Inadequate ventilation can lead to mold, high concentrations of CO_2, and other indoor air pollutants, which can lead to adverse health outcomes. Previous editions of the British Columbia Building Code relied on ventilation through the building envelope in combination with a principal exhaust fan. However, with the increased attention on the continuity of the air barrier system in buildings, builders can no longer rely on uncontrolled ventilation through the building envelope. In most buildings, mechanical systems will be required to provide adequate ventilation for occupants.

As described in Article 9.32.3.3., every dwelling unit must include a principal ventilation system. A principal ventilation system is the combination of an exhaust fan and a supply fan (or passive supply in some instances: see Sentence 9.32.3.4.(6)).

The principal ventilation system exhaust fan is separate from the requirements for a fan in every bathroom and kitchen. While a bathroom fan may be used to satisfy both the requirements for the principal ventilation exhaust fan and the requirements for a bathroom fan, the requirements for each must be met. If the fan provides this combined function of the principal ventilation exhaust fan and the bathroom fan, it will also need to have controls that conform to Sentences 9.32.3.5.(3) and (4). Unlike other bathroom fans, the principal ventilation exhaust fan is required to run continuously and should not have a control switch in a location where it may be turned off inadvertently.

A-9.32.3.4. Principal Ventilation System Supply Air.

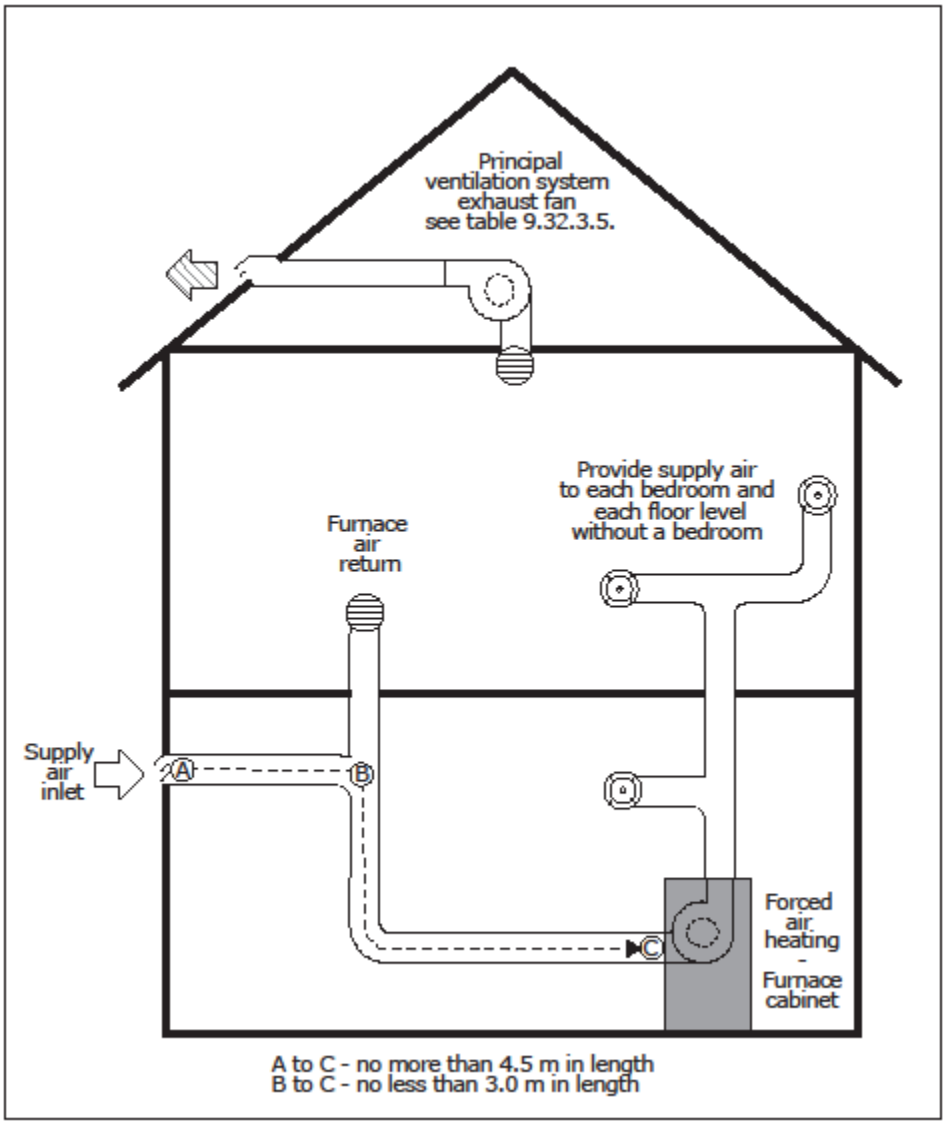

Figure A-9.32.3.4.(2)
Forced-Air Heating System Supply Air Distribution

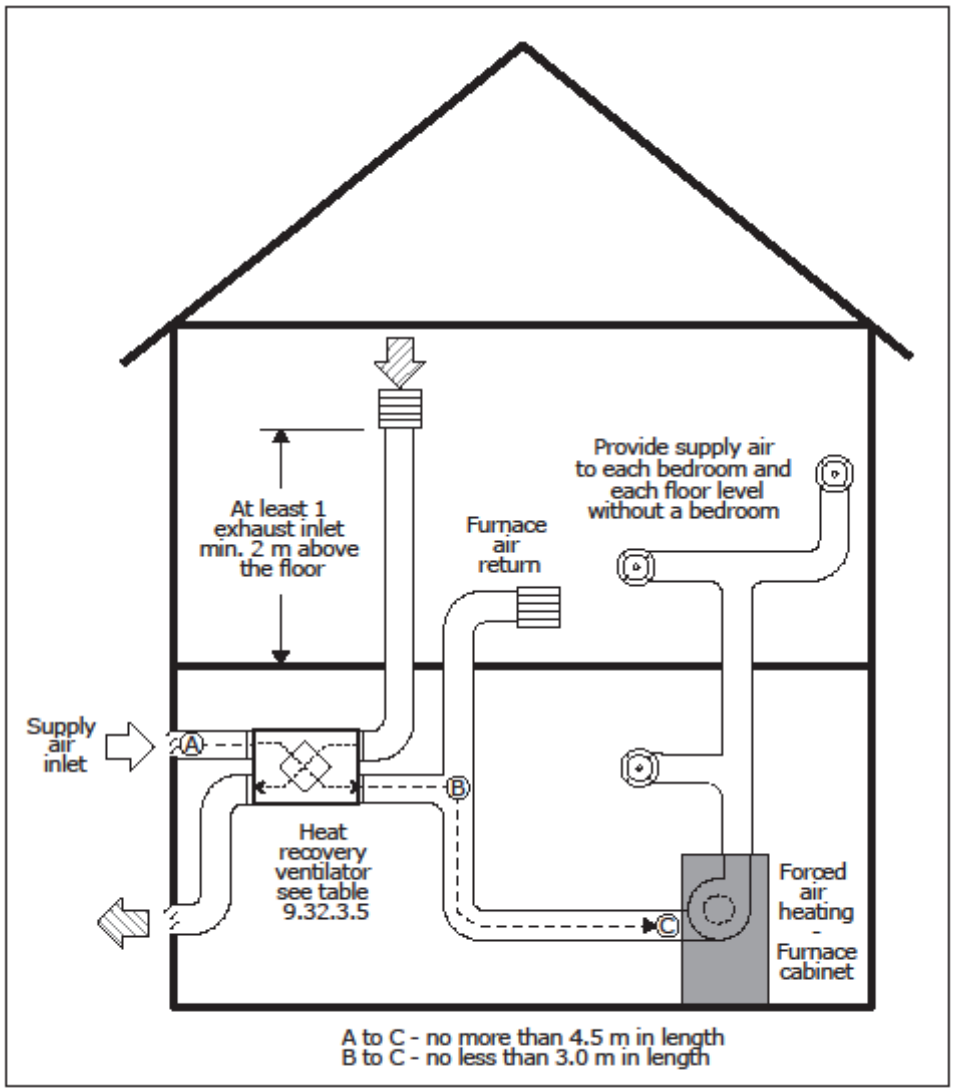

Figure A-9.32.3.4.(3)
Forced Air Heating System with Heat Recovery Ventilator Supply Air Distribution

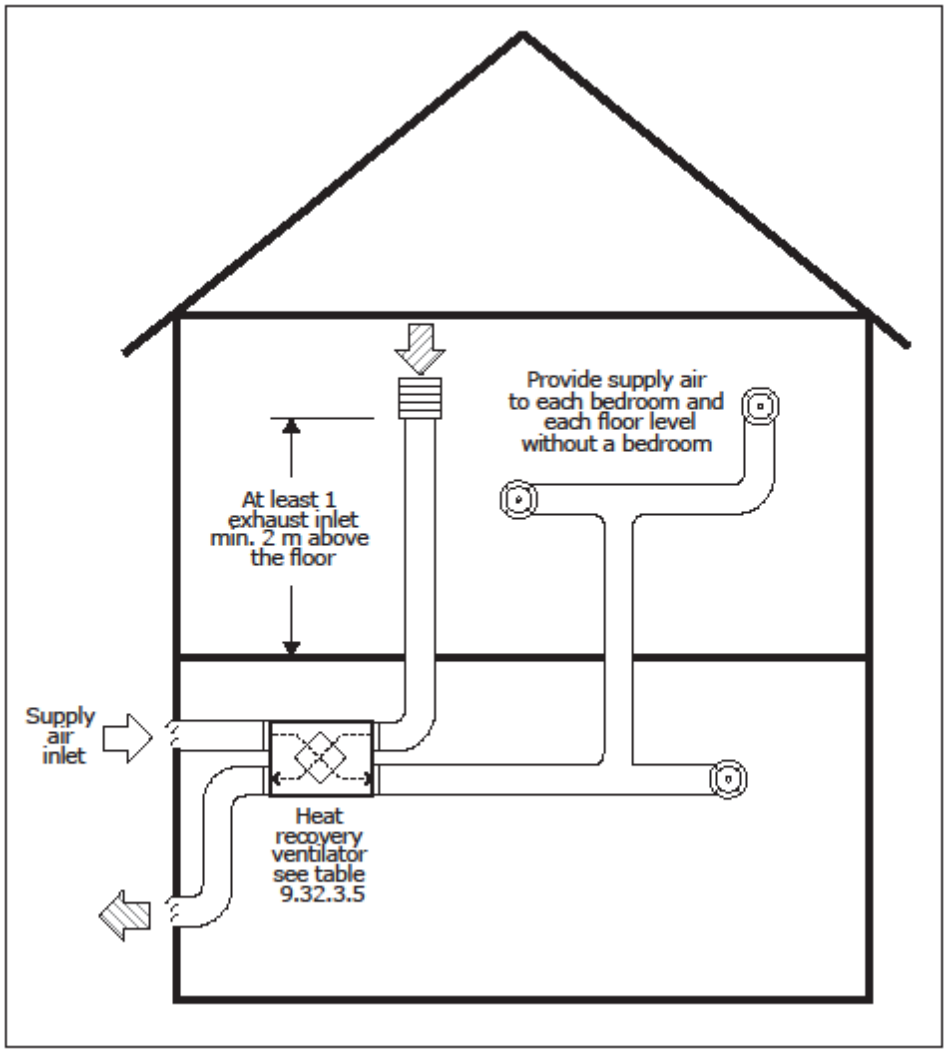

Figure A-9.32.3.4.(4)
Heat Recovery Ventilator Supply Air Distribution

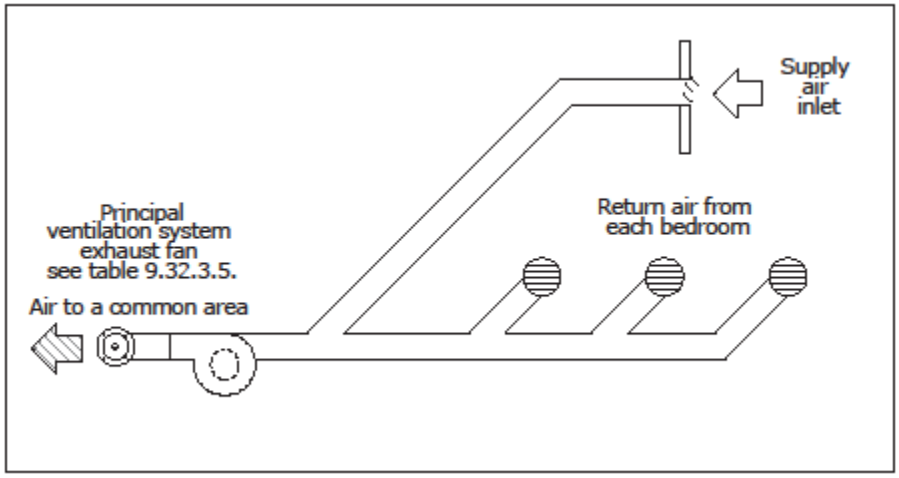

Figure A-9.32.3.4.(5)(b)(i)
Central Recirculation System Supply Air Distribution

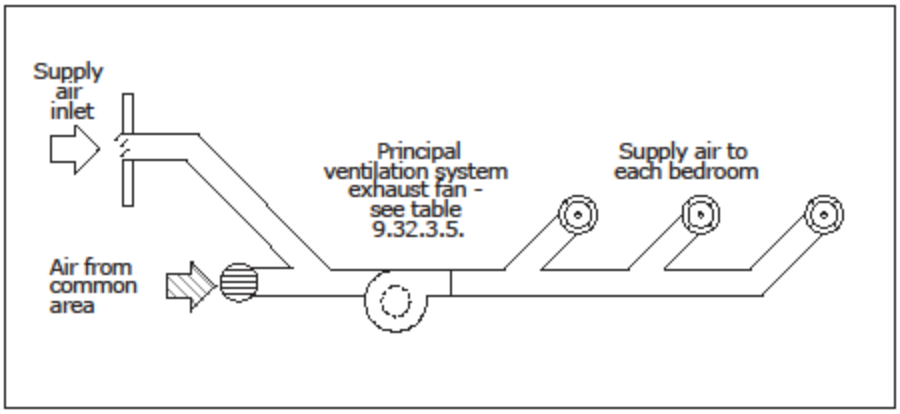

Figure A-9.32.3.4.(5)(b)(ii)
Central Recirculation System Supply Air Distribution

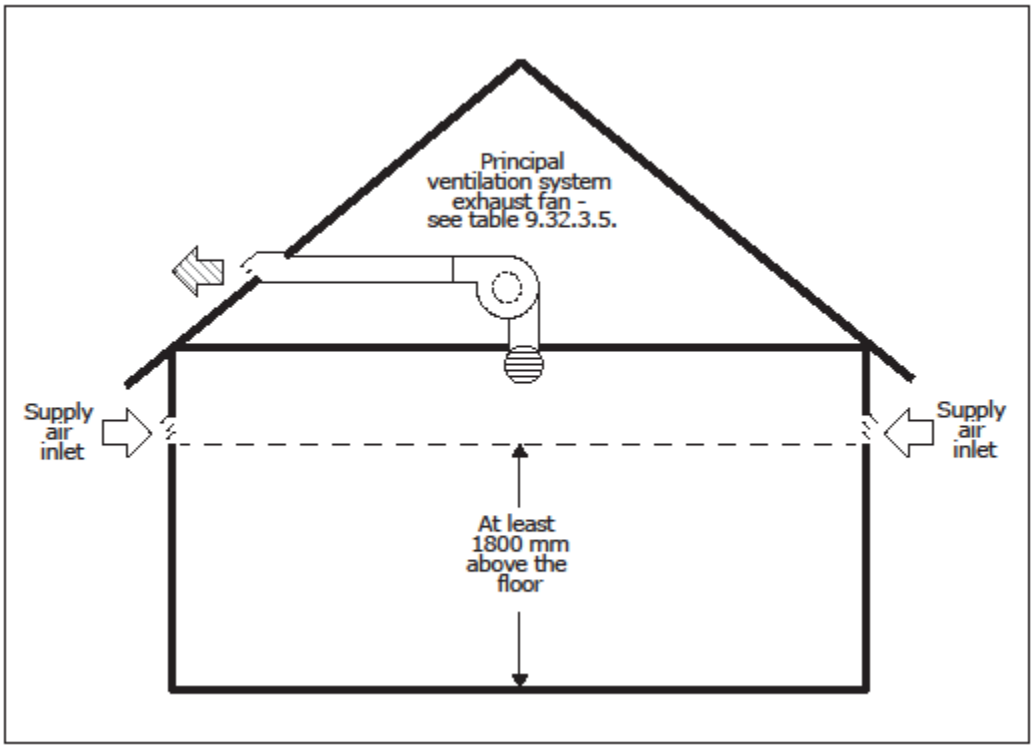

Figure A-9.32.3.4.(6)
Passive Supply Air Distribution

A-9.32.3.4.(6)(a)(ii) Floor Area Calculation for Passive Supply Air Distribution. The floor area to be calculated for Subclause 9.32.3.4.(6)(a)(ii) does not include sun porches, enclosed verandas, vestibules, attached garages, or other spaces that are outside the building envelope and do not require ventilation supply air.

A-9.32.4.1.(1)(a) Naturally Aspirating Fuel-Fired Vented Appliance (NAFFVA). NAFFVA, typically appliances with draft hoods, are subject to back drafting when a negative pressure condition occurs in the dwelling. The following tables describe the conditions under which Clause 9.32.4.1.(1)(a) applies:

Table A-9.32.4.1.(1)(a)A.
Vent Safety — Natural Gas and Propane

Fuel Type	Natural Gas and Propane			
Vent Type	Power Vent[3]	Direct Vent[3]	Thermal Buoyancy Chimney[2]	
Appliance Type	Furnace Boiler HWT Fireplace	HWT Fireplace Heater	Mid-Efficient F/A Furnace or Boiler[5]	Drafthood Boiler HWT[4]
Special Conditions				Located in Air-Barriered Room[1]
Classification	Non-NAFFVA		NAFFVA	Non-NAFFVA
9.32.4.1.(1)(a) Applies	No		Yes	No

Notes to Table A-9.32.4.1.(1)(a)A.:

(1) Mechanical room must be air-barriered from remainder of house with no access from within house. Room must be lined with panel products with sealed joints and all pipe and wire penetrations sealed. Effectively, the room must be finished before equipment is installed and holes drilled for pipes and wires. This option is not available for forced air furnaces as it is not possible to effectively seal the ducts.

(2) Thermal buoyancy chimneys must be within the heated envelope of the house to provide acceptable venting performance.

(3) Any power vented appliance with pressurized vent (1 pipe) or sealed combustion (2 pipe) or direct vent appliance (fireplace, heater or HWT) are non-NAFFVA.

(4) Mid-efficient (draft induced) appliances are considered NAFFVA with the exception of a boiler or HWT located in an air-barriered room.

(5) This category applies only to

(a) mid-efficient forced air furnaces equipped with induced draft fans and exhaust proving switch, and

(b) and boilers equipped with induced draft fans and exhaust proving switch.

Table A-9.32.4.1.(1)(a)B.
Vent Safety — Oil and Solid Fuel

Fuel Type	Oil			Solid		
Vent Type	Thermal Buoyancy Chimney[2]		Direct Vent	Thermal Buoyancy Chimney[2]		Any
Appliance Type	Boiler HWT[4]	F/A Furnace Boiler HWT[3], [4]	F/A Furnace Boiler HWT	Boiler	F/A Furnace Boiler HWT Fireplace Heat Stove	Outside Boiler
Special Conditions	Located in Air-Barriered Room[1]			Located in Air-Barriered Room[1]		
Classification	Non-NAFFVA	NAFFVA	Non-NAFFVA	Non-NAFFVA	NAFFVA	N/A
9.32.4.1.(1)(a) Applies	No	Yes	No	No	Yes	No

Notes to Table A-9.32.4.1.(1)(a)B.:

(1) Mechanical room must be air-barriered from remainder of house with no access from within house. Room must be lined with panel products with sealed joints and all pipe and wire penetrations sealed. Effectively, the room must be finished before equipment is installed and holes drilled for pipes and wires. This option is not available for forced air furnaces as it is not possible to effectively seal the ducts.

(2) Thermal buoyancy chimneys must be within the heated envelope of the house to provide acceptable venting performance.

(3) Oil-fired HWT, boilers and furnaces equipped with blocked vent switches.

(4) Sealed combustion kits can be added to oil-fired appliances but they switch to interior combustion air if intake is blocked and rely on barometrically dampered thermal buoyancy chimneys so they are considered NAFFVA.

A-9.32.4.2. Carbon Monoxide Alarms

Carbon monoxide (CO) is a colourless, odourless gas that can build up to lethal concentrations in an enclosed space without the occupants being aware of it. Thus, where an enclosed space incorporates or is near a potential source of CO, it is prudent to provide some means of detecting its presence.

Dwelling units have two common potential sources of CO:

- fuel-fired space- or water-heating equipment within the dwelling unit or in adjacent spaces within the building, and
- attached storage garages.

Most fuel-fired heating appliances do not normally produce CO and, even if they do, it is normally conveyed outside the building by the appliance’s venting system. Nevertheless, appliances can malfunction and venting systems can fail. Therefore, the provision of

appropriately placed CO alarms can improve safety in the dwelling unit is a relatively low-cost back-up safety measure.

Similarly, although Article 9.10.9.16. requires that the walls and floor/ceiling assemblies separating attached garages from dwelling units incorporate an air barrier system, there have been several instances of CO from garages being drawn into houses, which indicates that a fully gas-tight barrier is difficult to achieve. When the attached storage garage is located at or below the elevation of the living space, winter season stack action will generate a continuous pressure between the garage and the dwelling unit. This pressure is capable of transferring potentially contaminated air into the house. The use of exhaust fans in the dwelling unit may further increase this risk.