

Town of Qualicum Beach

Bulletin 2015-01: BCBC Energy Provisions for Part 9 Buildings

Effective December 19, 2014, changes were introduced to the *BC Building Code* for sections 9.32 & 9.36. This is a reference guide outlining the most notable changes for the Part 9 prescriptive path option, affecting construction within the Town of Qualicum Beach.

The following information has been sourced from the *BC Building Code 2012* (BCBC) and is for information purposes only. The BCBC 2012 takes precedent over any information provided in this document.

9.36 Energy Efficiency – Heat Transfer & Air Leakage

Three compliance paths are permitted, Part 9 Prescriptive, Part 9 Performance and the National Energy Code of Canada for Buildings (NECB)

Building Type	Part 9 Prescriptive	Part 9 Performance	NECB
-Houses & houses with secondary suites. -Buildings containing dwelling units and < 20% common areas	Permitted	Permitted	Permitted
-Purely residential buildings -Any building with non-residential portions are <300m ² (except F-2)	Permitted		Permitted
-Any Building with >300m ² of non-residential area -Buildings containing F-2 occupancy			Permitted

Heat Transfer

The Town of Qualicum Beach is classified as falling into Climate Zone 5 (3000-3999 Heating degree Days) under the new BCBC designations. This results in a modest increase in insulation values required under the new system. Thermal resistance is now calculated as an “Effective Value”, rather than the nominal value that has been the standard in the past. Effective Value takes into account all materials in the building assembly and includes them in the calculation by an accumulation method to determine the R or RSI value. This application is further changed by requiring differing insulating values depending on whether an HRV (Heat Recovery Ventilator) is incorporated into the building ventilation/heating system.

See tables on next page for required effective values and examples of assemblies meeting the required values.

Minimum <u>Effective</u> Thermal Resistance Values: without HRV	
Ceilings below attics.....	RSI 8.67 (R-49)
Vaulted/ flat roofs (no attic above).....	RSI 4.67 (R-26.5)
Exterior framed walls.....	RSI 3.08 (R-17.5)
Floors over unheated space.....	RSI 4.67 (R-26.5)
Foundation walls.....	RSI 2.98 (R-17)
Heated floors	RSI 2.32 (R-13)
Unheated floors (above frost line).....	RSI 1.96 (R-11)

Minimum <u>Effective</u> Thermal Resistance Values: with HRV	
Ceilings below attics.....	RSI 6.91 (R-39)
Vaulted/flat roofs (no attic above).....	RSI 4.67 (R-26.5)
Exterior framed walls.....	RSI 2.97 (R-17)
Floors over unheated space.....	RSI 4.67 (R-26.5)
Foundation walls.....	RSI 2.98 (R-17)
Heated floors.....	RSI 2.32 (R-13)
Unheated floors (above frost line).....	RSI 1.96 (R-11)

Typical wall assembly for Qualicum Beach

Wall framing & Nominal insulation value	2x6 studs 16" o/c with (R-22) Batt
Other wall components and values	Exterior air film.....RSI 0.03 Concrete composite siding.....RSI 0.023 9.5 mm rain screen air space.....RSI 0.15 Building paper/house wrap.....RSI 0.00 7/16" OSB sheathing.....RSI 0.11 Poly vapour barrier.....RSI 0.00 ½" GWB.....RSI 0.08 Primer/paint.....RSI 0.00 Interior air film.....RSI 0.12
Total effective thermal resistance value RSI 3.06* *Typical local wall assembly would not meet the required RSI 3.08 using R22 insulation. Additional design requirements would be needed to bring this wall into compliance. Installing an HRV, increasing the nominal insulation value to R-24, use of 5/8" GWB in place of ½" on exterior walls are samples of the many options to bring the wall assembly into compliance.

In addition to the changes in determining the required insulation values, there have also been a few changes in regard to the application of insulation. Noteworthy items are as follows:

- Ducts, piping, electrical cabinets, etc., must not reduce the effective insulating values
- Rim joists to have the same effective insulation value as above ground walls
- Attic effective insulation values are permitted to be reduced for a maximum distance of 1.2 meters in from exterior walls but in no case shall they be lower than RSI 3.52 (R-20)

- Where an exterior wall, or insulated attic or roof space is penetrated by a structural element, extra provisions are required to offset the break in continuity of the insulation, where applicable
- Foundation walls are now required to be insulated from top of wall down to the footings with a provision for a 50% reduction in insulation where it abuts a floor slab
- Access hatches along the plane of insulation are required to be insulated to a nominal value of RSI 2.6 (R-15)
- All heating/cooling equipment is to be located within the plane of insulation, unless otherwise designed by the manufacturer
- Minimum of 12mm of insulation is required for the first 2.0 meters of the inlet and outlet piping for all hot water heating systems
- Piping for heating and cooling systems must be within the plane of insulation or insulated to a value equivalent to that for the exterior walls
- Windows and doors are required to have a maximum thermal transmittance of 1.80 U-Value, W/(m².K)
- One door per building, separating conditioned space from unconditioned space is permitted to have a U-Value of 2.6 W/(m².K)

Air Leakage

The building air barrier is to be constructed as a continuous barrier to the passage of air through the building envelope. The air barrier must be continuous across joints, between assemblies and around penetrations.

The air barrier system must have an air leakage rate of less than 0.2 L(s.m²) at 75 Pa. When tested in accordance with CAN/ULC-S742 or ASTM E2357 Examples of materials meeting or exceeding a leakage rate of 0.20 L(s.m²): 0.15 (6 mil) Polyethylene sheet, 7/16" OSB and plywood and GWB.

Sealants used to ensure continuity of the air barrier must be: non-hardening, or be in compliance with the currently accepted product standards for sealants under 9.27.4. Additionally, Bead applied Air Sealant Foam complying with CAN/ULC-S710.1 or CAN/ULC-S711.1 may also be used to seal junctions in the air barrier system.

Areas of note that have increased or changed requirements are:

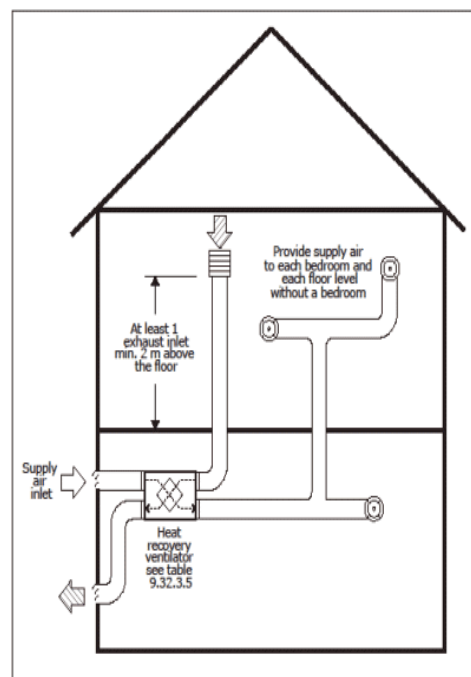
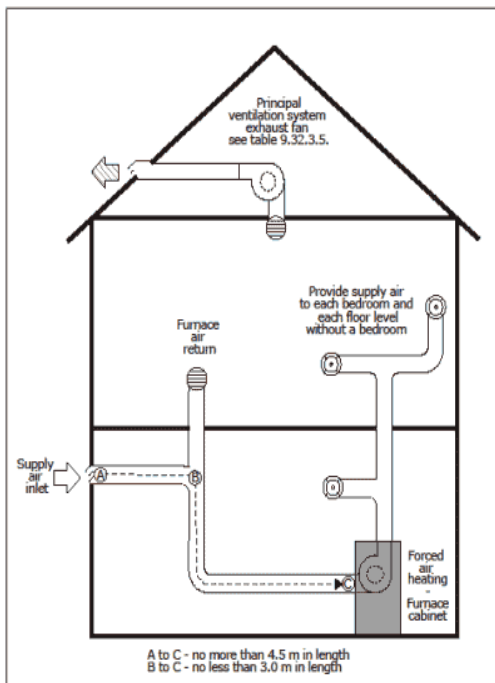
- All joints in poly air/vapour barriers to be lapped minimum 50mm (2") sealed and structurally supported.
- Ceiling and wall poly will now need to be sealed to wall poly and not just overlapped and compressed between drywall and framing
- Poly pans used to seal penetrations in the air barrier will need to be supported by framing at all joints, electrical boxes on exterior walls, ceilings, etc., will need to be flanged and gasketed or supported on all sides by framing
- Crawlspace ground cover to be sealed to the foundation wall (existing requirement)
- Continuous air barrier sealing achieved by sealing from the foundation to the sill plate, sill plate to the rim joist, rim joist to the subfloor, subfloor to the bottom wall plate.
- Penetrations in the interior wall top plates that are at the line of the air barrier are required to be sealed
- Electrical wires plumbing pipes, etc., are required to be sealed where they pass through the air barrier

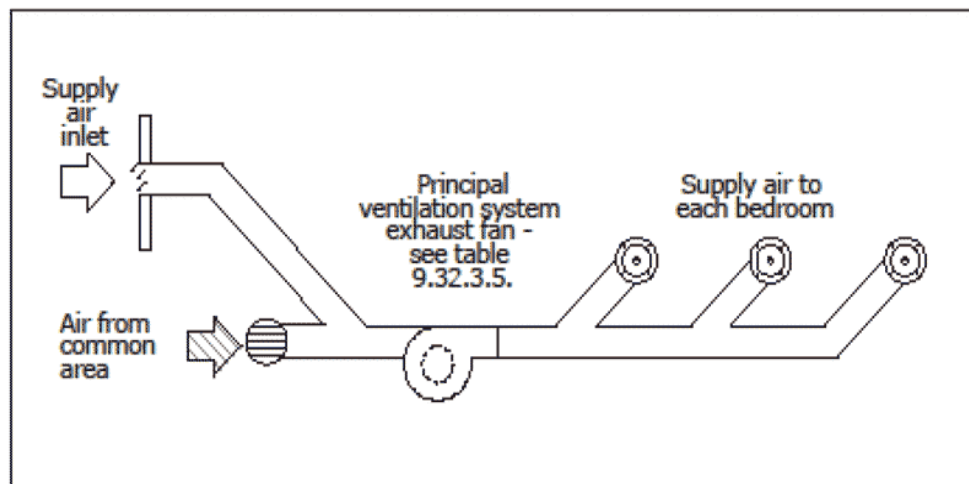
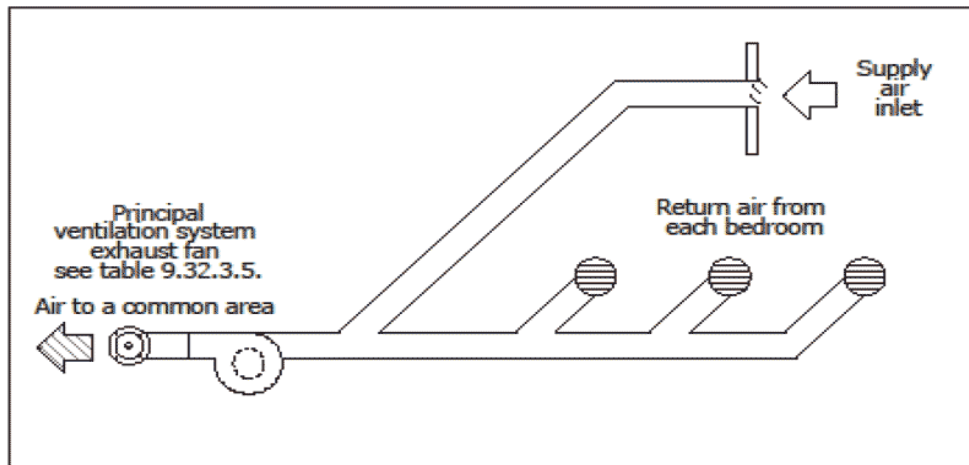
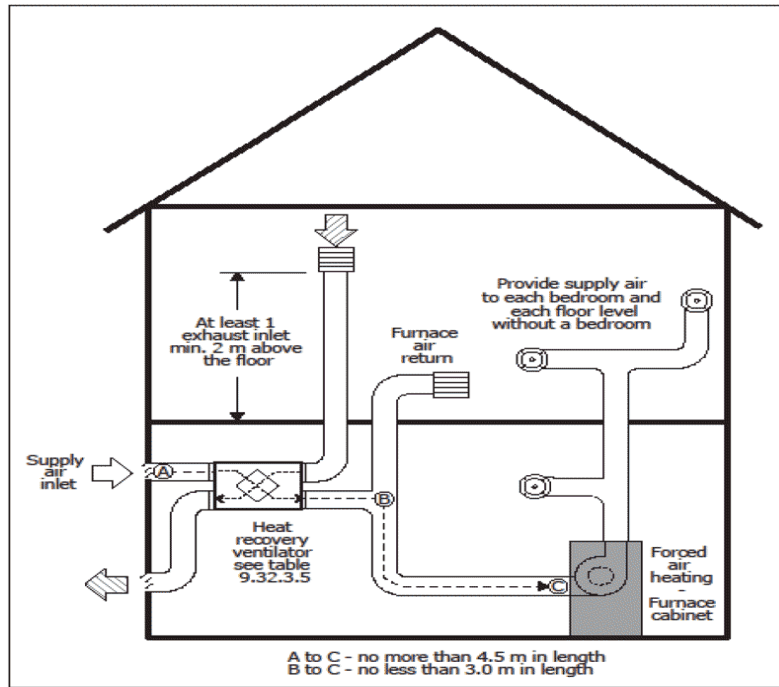
- Pot lighting fixtures need to meet the requirements for an air barrier or poly pans are to be installed
- All ducts that carry conditioned air are to be sealed at all joints and where they pass through the air barrier
- Fireplaces are to be constructed air tight when not in use

9.32 Ventilation

The new ventilation provisions specified in 9.32 of the BCBC no longer permit an exhaust only type of principal ventilation system. It now requires a system that provides both supply and exhaust air. The new system must run continuously 24 hours a day and be controlled by a dedicated switch. The switch is to be labelled and provided with only on and off settings, unless it is also used as a kitchen or bath fan. In those cases the lowest setting must not be less than required for the primary ventilation system for that type of building. For a typical Qualicum Beach house of less than 280m² in area that is 3 bedrooms or less, the primary exhaust system would need a capacity of 28 l/s (60 CFM) and a sound rating of a maximum of 1 sone.

See below for examples of acceptable principal ventilation systems:





- Kitchen fans are required to exhaust at a minimum rate of 47 l/s (100 CFM), bath fans are required to have a capacity of 23 l/s (50 CFM) for intermittent run and 9 l/s (20 CFM) for continuous run fans
- All bedrooms and floor levels without bedrooms must be supplied with supply air
- All interior doors must be undercut a minimum of 12mm or supplied with air transfer grills
- Forced air/heated crawlspaces must have a mechanical means to supply conditioned air and return air from the space
- Other than forced air/conditioned crawlspaces, a provision for passive air connections must be installed between the conditioned space above and the crawlspace at a ratio of one vent for every 30m² of crawl space area. This is to include provisions for supply or exhaust air at the crawlspace unless the number of vents is doubled.

Permit Submissions

Permit applications for new construction as well as applications for substantial renovations/additions should include the following information

Indication of path chosen:

- Part 9 Prescriptive (indicate trade off's and calculations, if used)
- Part 9 Performance (requires performance modeling/Certified Energy Advisor)
- NECB, including path chosen and CEA documentation where applicable

Detailed wall ceiling and floor assemblies, including effective insulation values/calculations with air and vapour barrier locations

U-values for all windows, doors and skylights

Indicate the compliance path option used for the Principal Ventilation system design, including fan rating, if HRV included and crawlspace venting design. Eg: 9.32.3.4.(3) Forced air heating system, with HRV, 60 CFM fan and mechanical conditioned air to crawlspace with passive vents equal to one for every 30m² of crawlspace.

If you have any further questions do not hesitate to contact the Town of Qualicum Beach Building Department at building@qualicumbeach.com, 250 752 6921