FNNBOA
First Nations National Building Officers Association
5717 Old Hwy #2
P.O. Box 219
Shannonville, ON | K0K 3AO
Tel: (902) 895-6385 ext 254
e-mail: info@fnnboa.ca

Eagle's Eye on Housing:
Improving Indoor Air Quality and Crawl Spaces

A large number of our homes are lost prematurely every year due to problems associated with crawl spaces. The decision to build on a crawl space should include an analysis of lifetime cost versus immediate capital expenditures. Ask the question: How long do houses built on crawl spaces last, compared to other foundation systems?

Any homeowner whose house sits on a crawl space can list the problems:

- Mould and mildew, high humidity levels, wood rot, unpleasant smells
- Pests, such as insects and mice
- Water leakage through foundation walls; standing water
- Cold floors and drafts
- Frozen water lines

Improving indoor air quality (IAQ) requires a basic understanding of building sciences: Warm air rises (the stack effect), high air pressure moves to low air pressure, hot air moves to cold, and high moisture moves to low moisture. Mould likes a humidity level above 60 percent.

The new codes are out, and yes, vents in crawl-space walls are still there. Where in Canada is that a good idea? Let's increase the humidity level in summer by introducing warm humid air into a cool environment where it can cool and condense — even better, let's punch holes in the walls so we can increase our heating bills and invite in mice and insects! Seems silly when put that way, doesn't it?

We know that warm air rises, and that humidity levels rise with the availability of moisture. We also know that mould needs moisture to grow. In "dirty crawl spaces" (you know the ones: no ground cover, used to store old clothes, papers, books, boxes — a delicious buffet for mould), the warm air rises, sucking up moisture from the dirt floor and spewing mould spores into the main-floor living area, through cracks in the heating ducts and crawl-space access points. This can seriously affect the health of the occupants.

Rather than invite in unconditioned air, we should ensure that all the air in our homes is conditioned, and that we prevent the entry of moisture. A better idea is to install a ground cover in the crawl space, to seal the moisture-laden dirt, and provide an effective air barrier by sealing the foundation walls, joist-space cavities and cracks. This keeps ground moisture out, and everything in the crawl space from being exposed to unconditioned air.

We should provide ventilation to that area. The crawl-space vent is still in the code book, but if you analyze it, passive vents are for non-heating seasons only. In the heating season, mechanical ventilation is a requirement. Why not provide mechanical ventilation year-round by interlinking the principal exhaust with the crawl space? Other possibilities include using vapour barriers that are more durable than Polyethylene. An internet search on "dirty crawl spaces" will provide more information on durable Vapour Barrier encapsulating systems, as will the "About Your House" series of pamphlets available at the Research and Development Library at CMHC, www.cmhc-schl.gc.ca. Ensure the dryer vent is ducted to vent to the exterior. Moisture-laden air

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from dryer vents, besides promoting mould growth, is full of dryer lint, which can become a fire hazard.

Awareness and information are key to better understanding indoor air quality. Ask your regional CMHC AB CAP for training details on Let's Clear The Air, IAQ, mould remediation and basic home maintenance.

Strategies for solving IAQ problems

Remove the sources: Eliminate smoking inside the house. Clean regularly using unscented cleaning and personal care products. Remove carpets and pressed wood furniture from the bedroom. Remove paints, solvents or cleaners and store outside the home. Select furnishings with no or lower emissions. Ensure CO detectors are working properly. Check for carbon monoxide, back drafting. Avoid pesticide use.

Seal surfaces: Where possible, seal exposed surfaces of pressed woods prior to assembly. After assembly, seal undersides and backs of pressed wood furniture with acrylic sealer, aluminum foil or poly. Seal any exposed insulation. Install ground sheet covers.

Ventilate: Exhaust stale, moist air from kitchens and bathrooms using good-quality, quiet fans. Provide fresh air to bedrooms and main living areas and install return air vents.

Filter: If you have a problem with dust or dusty air, always remove the sources first. Running the furnace fan continuously with a good filter (e.g. a MERV 10 filter or better) will help reduce airborne dust and particulate, but is never as effective as source removal.