Crawl Spaces

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Funding

Funding for this class was provided by the Alaska Housing Finance Corporation (AHFC).

This course is designed to empower homeowners with the knowledge to live in and maintain a safe, energy efficient home.

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Topics for today:

- AHFC programs
- Benefits of crawlspace best practice
- Past crawlspace design
- Insulating
- Ventilation

AHFC Energy Efficiency Programs:

- Home Energy Rebate Program
- Weatherization Assistance Program
- New Home Rebate
- Second Mortgage for Energy Conservation
- Energy Efficiency Rate Reduction Mortgage
- www.ahfc.us

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What are some benefits of insulated and ventilated crawl spaces?

A place to put stuff?

Warm place to run utilities

Ability to control condensation

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How have we built crawl spaces in the past?

Under it all

What are the past building practices?

- ❑ Damp proofed the foundation walls
- ❑ Passive ventilation through operable foundation vents
- ❑ Poorly installed unsealed polyethylene sheeting as a vapor retarder
- ❑ May or may not have insulated the crawl space walls

Keeping the crawl space dry

Rim Joist Insulation

Wall Insulation

Ventilation

Ventilation

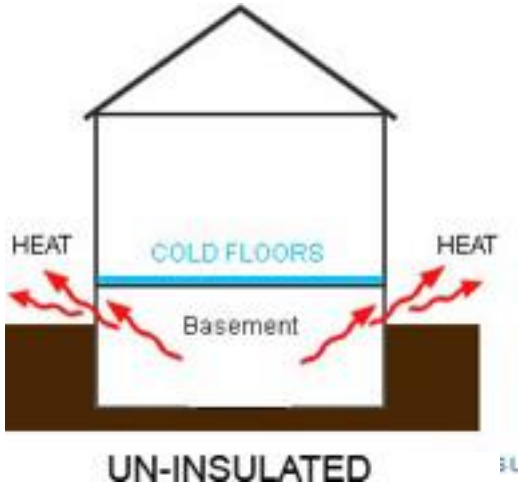
Past failures :

- ❑ Bulk water
- ❑ Condensation on walls
- ❑ Condensation on water pipes
- ❑ Moisture accumulation
- ❑ Frozen water pipes
- ❑ Mold and mildew

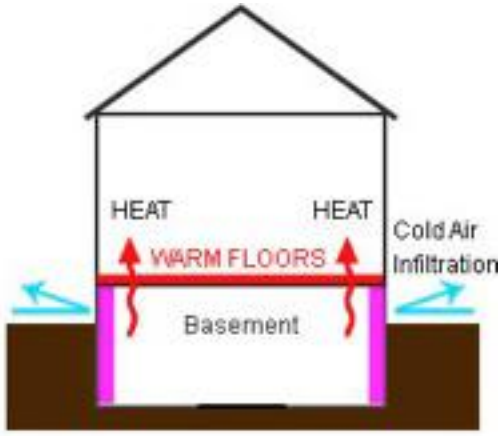
How have these past practices worked for us?

Click play button to start video. Slide marker to the end before advancing slide.

Past failures (continued)



UN-INSULATED

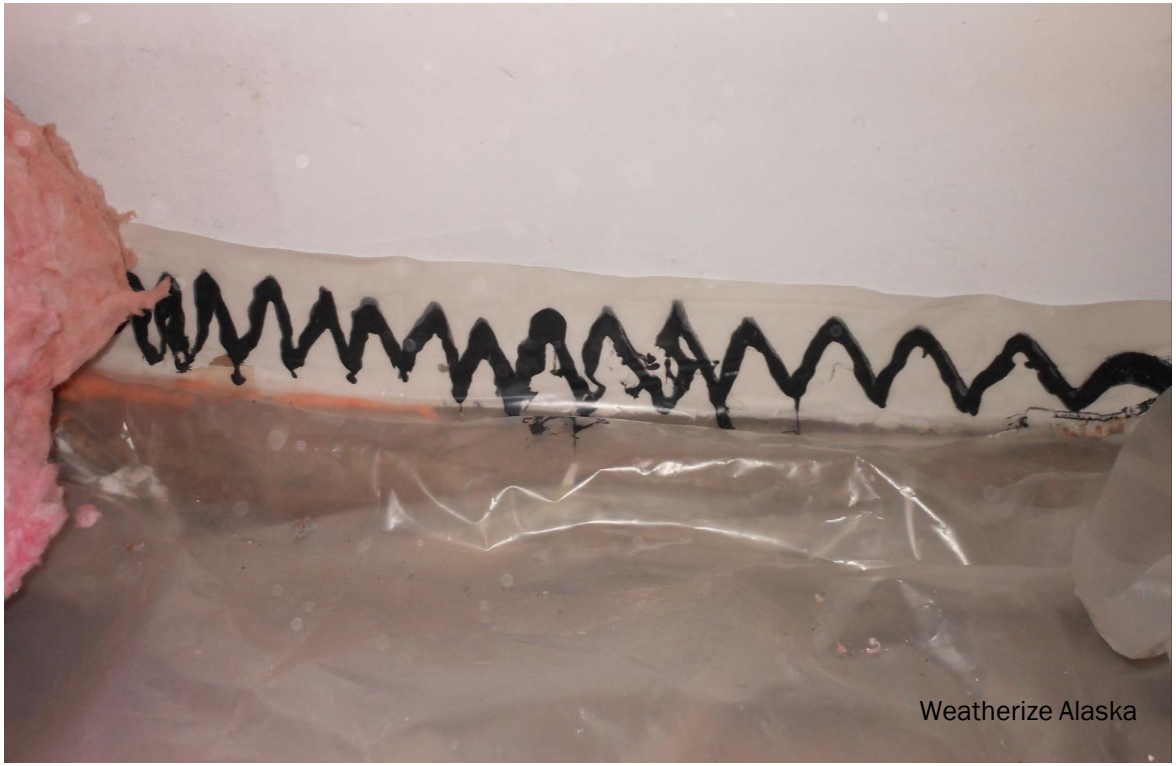


INSULATED

- Contaminates
- Air leaks

ecoinsulation.ca

How to improve crawl spaces?



Block the moisture with a ground vapor retarder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Block the moisture. Why?

Where should the vapor retarder be?

Insulating the crawl space

Prevent wood rot

- Condensation can form on surfaces when crawlspace temperature drops or humidity rises.
- Moisture on wood from condensation causes rot
- Condensation on cold metal ducts in the crawl space in winter can produce a large volume of water
- Condensation on copper and PEX water pipes in summer can drip onto the vapor retarder , form pools and grow mold and mildew

Air Seal

Insulating the crawl space

Insulating the crawl space

Exterior insulation = Best Practice

Best practice for interior insulation

Interior wall insulation options:

- ❑Fiberglass
- ❑Rigid foam
- ❑Spray foam

When & where fiberglass works


Weatherize Alaska

- Relatively dry climates
- Mechanical & permanent attachment
- Low average relative humidity
- Relatively dry soils for most of the year


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Insulating the crawl space

Why fiberglass can be risky

- ❑ Fiberglass can only be used on walls that stay dry
- ❑ Fiberglass touching damp walls will get wet and thermal performance will be diminished

Strategies for water damaged fiberglass

- ❑ Consider replacing the fiberglass with foam insulation
- ❑ Replace damaged fiberglass after the crawl space is successfully mechanically ventilated to control humidity
- ❑ Control moisture seepage through foundation walls

If you are using fiberglass insulation in retrofits

- ❑ Understand the conditions
- ❑ Provide adequate mechanical ventilation

Insulating the crawl space

Crawl space wall VB

- ❑ May be pre-existing
- ❑ Placement varies

With mechanical ventilation

- ❑ Not recommended over interior insulation
- ❑ Remove to dry wet insulation & walls

Climate Zones

Table A301.1(2) - Climate Zones for Alaska by HDD[a]			
IECC zones for Alaska	**HDD[a] Range (IECC)**	**Old BEES Climate Regions**	**HDD[a] Range (Old BEES)**
Zone 6	7200 - 9000	Region 1 - Southeast	7000-10,700
Zone 7	9000 -12,600	Region 2 - Southcentral	8600-13,500
Zone 8	12,600 -16,800	Region 3&4 - Interior & Western	11,300-17,700
Zone 9	16,800 -21,000	Region 5 – Arctic Slope	16,900-20,300

Insulating the crawl space

Best Practice for Insulating

Determine the required R-value of the crawl space wall.

Table R-A402.1.1 Nominal Insulation and Glazing Minimum R-values by Component April 3, 2012 AK Amendments							
Climate Zone	Windows, Doors & Skylights	Ceiling [a]	Exterior Wood Frame Wall	Floor	Below Grade Wall [b]	Slab [c] & Depth	Crawl Space Wall [b]
6	3.33	54 or 43	25	38	15/19	15, 4ft	15/19
7	3.33	54 or 43	25	38	15/19	15, 4ft	15/19
8	4.5	59 or 48	30	38	15/19	15, 4ft	15/19
9	5	65 or 52	35	43	NR	NR	NR

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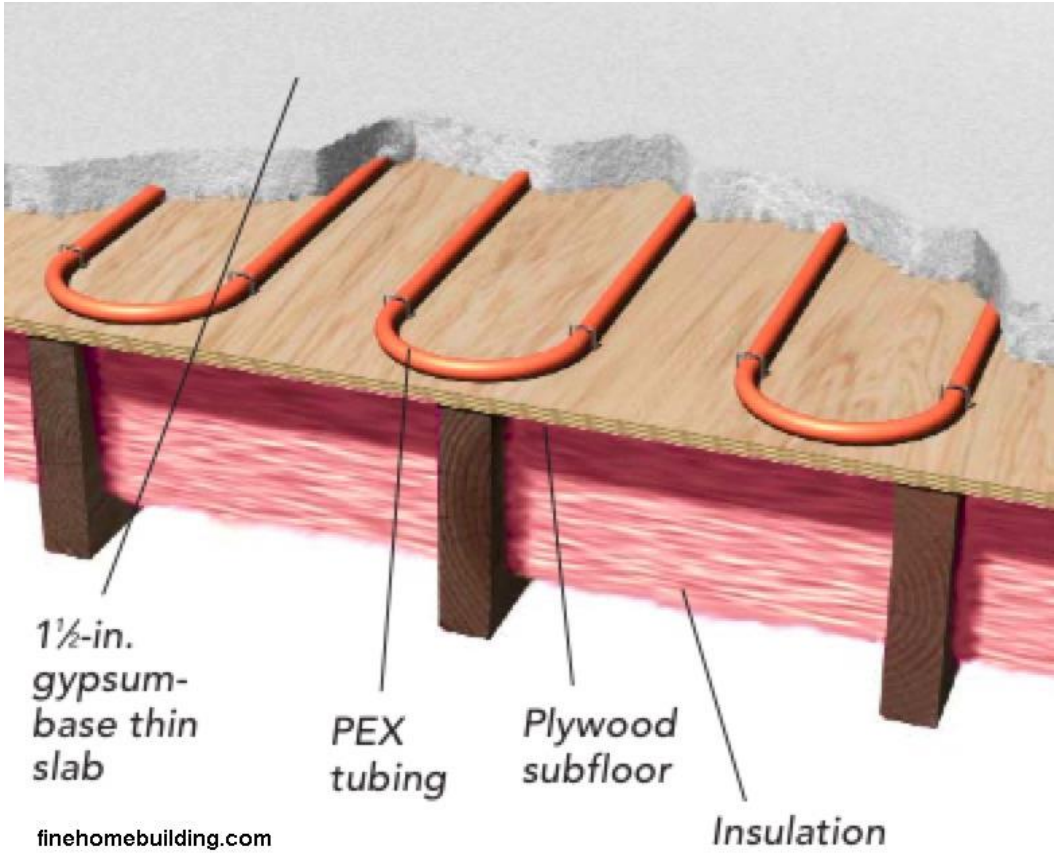
Insulating the crawl space



Radiant flooring

- ❑ An insulated floor above creates an unconditioned crawl space
- ❑ Insulated exterior walls creates a conditioned crawl space

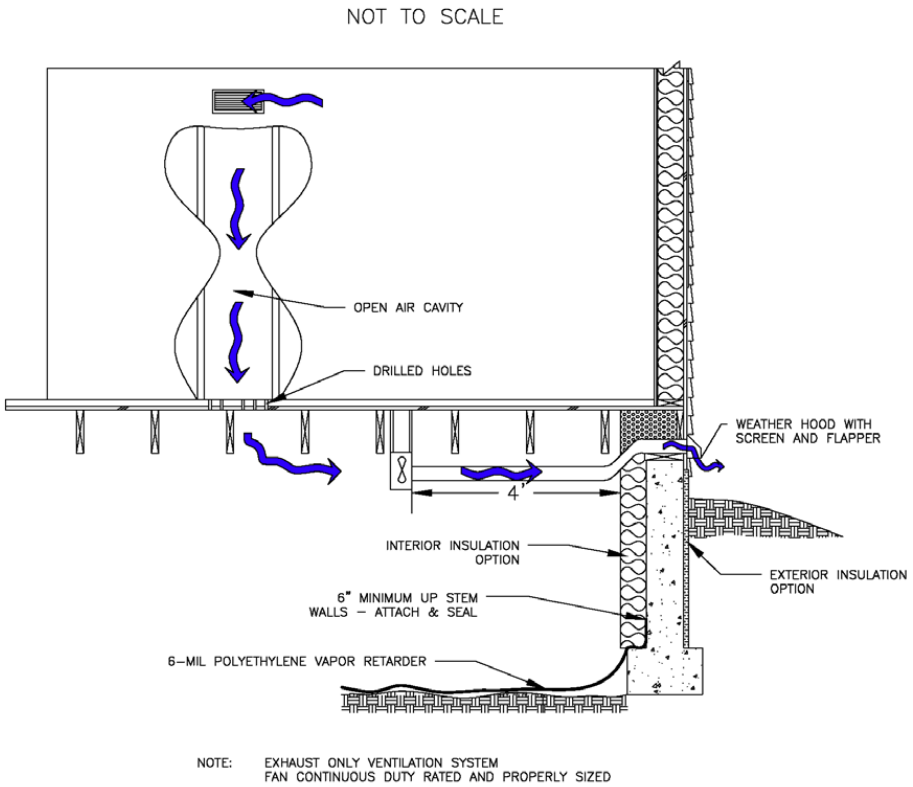
Radiant floor heating design may warrant leaving the insulation in the floor joists. This configuration is still defined as a conditioned crawl space.

Insulating & air sealing the crawl space

Best practices for rim joist sealing

CCHRC

Ventilating the crawl space



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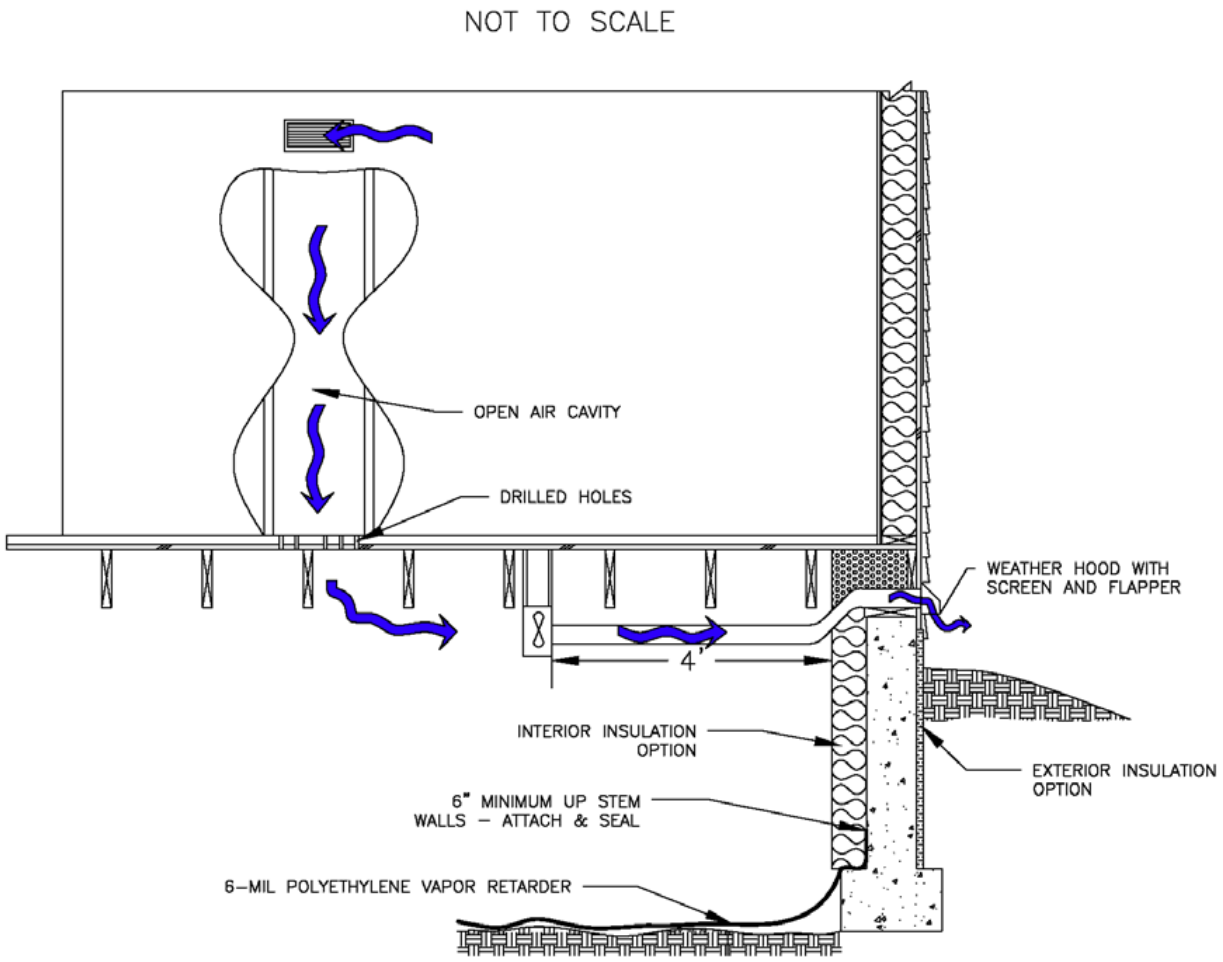
Best Practices for exhaust only ventilation

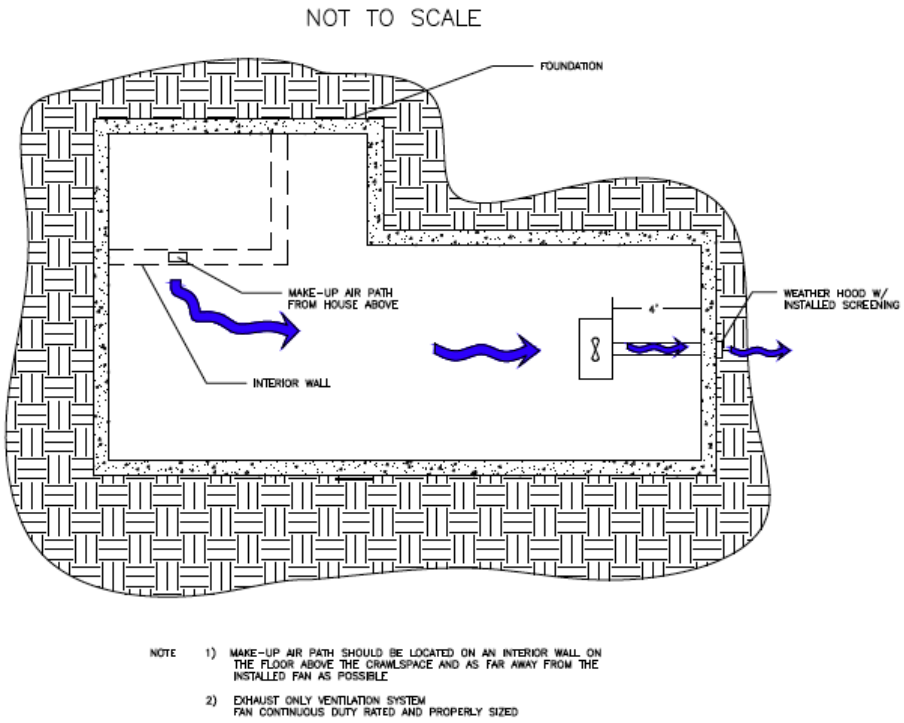
Design a mechanical ventilation system for a crawl space with a designated pathway to bring make-up air from the living space above into the crawl space.

- ❑ A stud bay may be used by creating openings at the bottom plate of the interior wall above
- ❑ A louvered vent cover could be installed near the ceiling of the wall above to allow air to be drawn down into the crawl space

Ventilating the crawl space



Ventilating the crawl space



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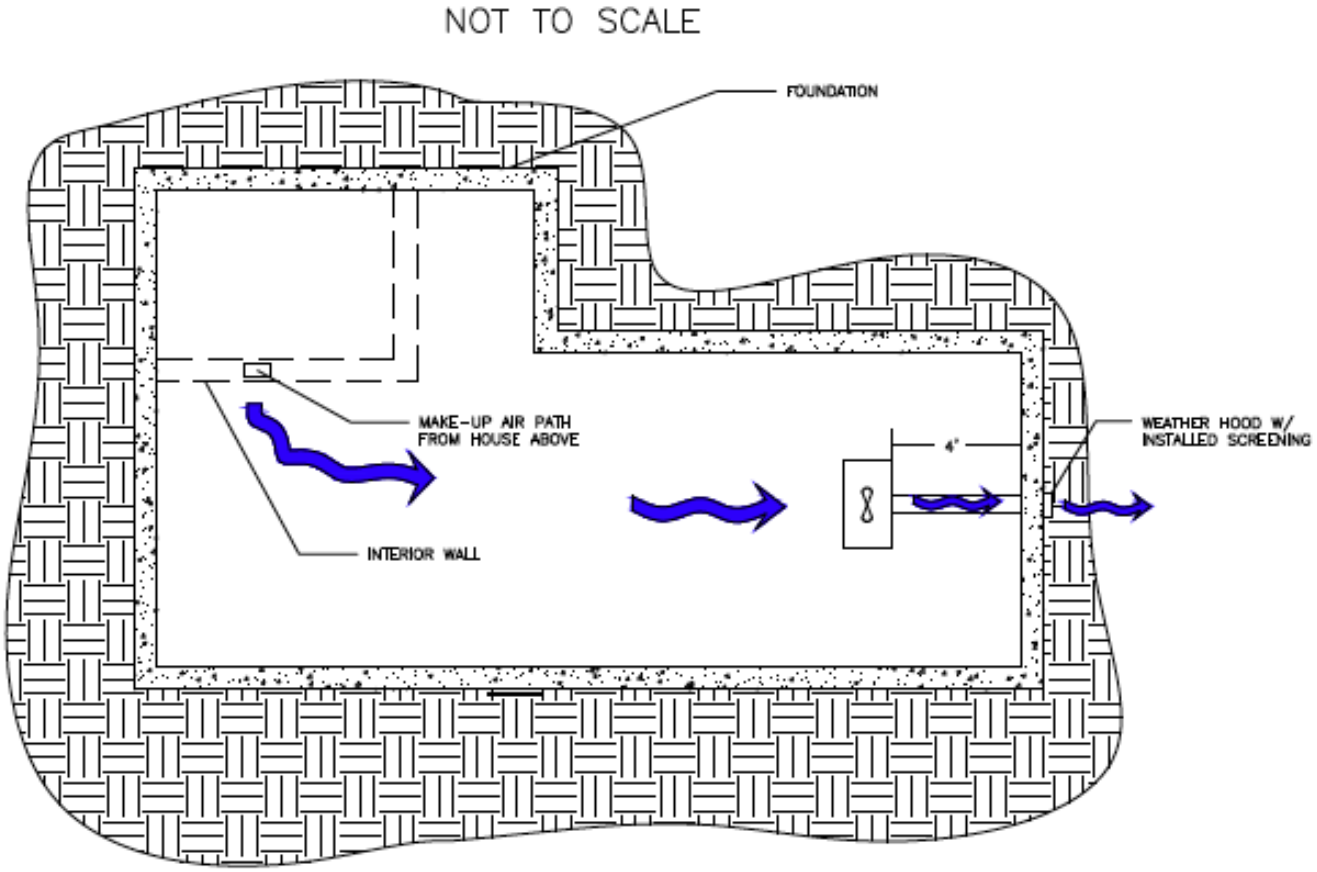
Best Practices for installation of mechanical ventilation

The crawl space fan should be installed to hang from the floor above.

- ❑ Should be approximately 4 feet from a foundation wall and across the crawl space from the designated pathway to encourage air movement across the crawl space area
- ❑ The exhaust ducting would then be installed through the foundation wall
- ❑ An abandoned foundation vent opening could be used for the exhaust duct location

Ventilating the crawl space



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Ventilating the crawl space

Best practices in sizing a continuously operating exhaust fan for the crawl space

The IRC (International Residential Code) 2009 requirements should be used to size the fan.

- Continuously operated mechanical exhaust ventilation at a rate equal to 1 cubic foot per minute (cfm) for each 50 square feet of crawl space floor area

Resources

- AHFC - Research Information Center
- Alaska Residential Building Manual
  www.ahfc.us
- Cold Climate Housing Research Center
  www.cchrc.org
- One stop shop for AK Energy Efficiency information
  www.akenergyefficiency.org