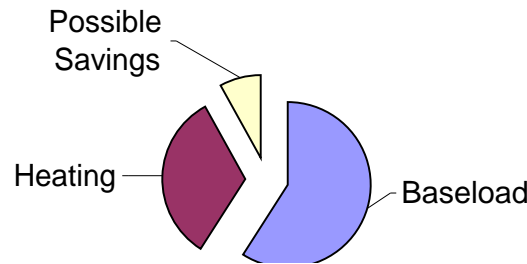


## Building Insulation

Insulation is one of the most important features of your home. Insulation reduces heat flow so that less energy is used during the winter. Adequate insulation levels also keep your home more comfortable, and cuts down on noise from outside.

The average home in Port Angeles has an annual energy use of about 17,300 kWh's at an annual cost of about \$1139. If you install building insulation you may save from 10% to 20% of your energy use for home heating each year. For the average all-electric home in Port Angeles that translates into a savings of \$40 to \$80 each year.

### Energy & Cost Savings 10% - 20%



### R-Value

The R-value, also called resistance to heat flow, is a measure of how much heat flows through an object. The higher the R-value the better its insulating power. R-values can be added together, for example, R-38 added to an R-11 results in R-49. Achievement of the highest levels of insulation in every area of a building is not necessarily a good investment. As insulation is added, thermal efficiency is increased. However, with each subsequent addition of insulation, the effect upon energy savings is diminished.

### Typical Insulation R-values per inch

Loose Fill Fiberglass.....	From <b>R-2.2</b> per inch
Loose Fill Rockwool.....	From <b>R-2.9</b> per inch
Low density Batt and Blanket Fiberglass.....	From <b>R-3.1</b> per inch
Medium density Batt and Blanket Fiberglass.....	From <b>R-3.7</b> per inch
Batt and Blanket Rockwool.....	From <b>R-3.7</b> per inch
Loose Fill Cellulose.....	From <b>R-3.7</b> per inch
Expanded Polystyrene Board (white bead board).....	From <b>R-4.0</b> per inch
High density Batt and Blanket Fiberglass.....	From <b>R-4.3</b> per inch
Extruded Polystyrene Board (blue and pink board).....	From <b>R-5.0</b> per inch
Polyisocyanurate Board (foil-faced).....	From <b>R-8.0</b> per inch

### Safety

Most facings attached to batt, blanket and board insulation materials are combustible and should never be left exposed. When ceilings are insulated, special attention must be paid to heat producing fixtures to separate them from the insulation. When walls are insulated, fire-stops must be installed to separate electric heaters from insulation. Floor insulation must be in substantial contact with the underflooring to conceal flammable facings. When ductwork is insulated, a special flame-resistant facing must be installed.

# Insulation Buyers Guide



## Insulation Buyer's Guide *Residential*

**Weatherwise Service** is an Energy Conservation Program offered by the **City of Port Angeles** in cooperation with the **Bonneville Power Administration** and the **Conservation Rate Credit**

For more information contact us by mail at:  
**Weatherwise Service**  
**City of Port Angeles**  
**321 E 5<sup>th</sup> St.**  
*Port Angeles, WA. 98362*  
phone:  
**Message Line: 417-4713**  
*FAX: 417-4709*  
or visit:  
**Conservation Programs**  
on the City's website at:  
**www.cityofpa.us**

## Insulation Types

There are three types of loose fill insulation that are commonly used in homes today: fiber glass, rockwool and cellulose. Fiber glass insulation is spun from molten sand and recycled glass into fibers. Rockwool insulation is a glassy fibrous substance made by melting and fiberizing slags obtained from smelting metal ores or natural rock. Cellulose insulation is made from recycled newspapers, then treated with a chemical flame retardant. Loose fill materials are commonly blown into attics and walls with a blowing machine.

Batts and blankets are another type of insulation that are commonly installed in floors and walls. Batts are similar to blankets but are pre-cut to uniform lengths. Blankets are available in longer lengths than batts and are designed to fit snugly between standard stud spacing. Board insulation is another type of insulation. Boards are typically used in flat or vaulted ceilings, concrete slabs, and below grade walls.

## Controlling Moisture

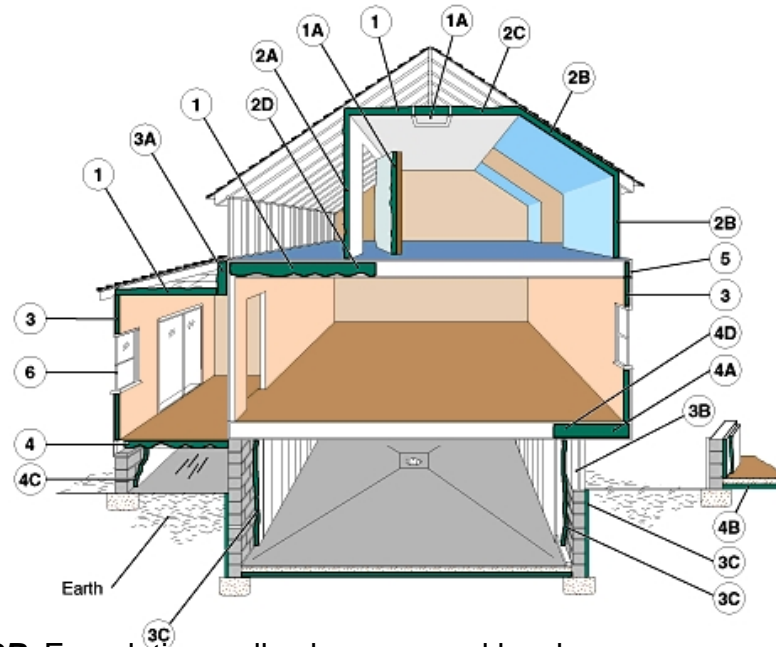
Insulation will lose much of its insulation R-value when wet. There are four ways that moisture is controlled in most homes.

1. Use exhaust fans in bathrooms and kitchens where most moisture is added.
2. Ventilate attics and crawlspaces to remove moisture.
3. Seal cracks around electrical boxes, recessed lights, heating ducts, chimneys, and other areas to reduce moisture transfer into unwanted areas.
4. Install a vapor retarder to reduce transmission of water vapor into unwanted areas.

## Building Areas That Need Insulation

Buildings should be insulated in the following areas:

- 1** In attic spaces, insulate between and over the floor.
- 1A** Attic access door.
- 2A** Between the studs of knee walls.
- 2B** Between the studs and rafters of exterior walls and roof.
- 2C** Ceilings with cold spaces above.
- 2D** Extend insulation into joist space to reduce air flows.
- 3** All exterior walls, including ...
- 3A** Walls between living spaces and unheated garages, shed roofs, or storage areas.



- 3B** Foundation walls above ground level.
- 3C** Foundation walls in heated basements, full wall either interior or exterior.
- 4** Floors above cold spaces, such as vented crawl spaces and unheated garages.
- 4A** Any portion of the floor in a room that is cantilevered beyond the exterior wall below.
- 4B** Slab floors built directly on the ground.
- 4C** As an alternative to floor insulation, foundation walls of unvented crawl spaces.
- 4D** Extend insulation into joist space to reduce air flows.
- 5** Band joists.
- 6** Caulk and seal around all windows and doors.

## Minimum Insulation Recommendations

Building Area	Existing Condition	Minimum Insulation Recommendation
Ceiling/Roof Insulation	If less than R-19	Increase to R-49
Floor or Interior Perimeter	If less than R-10	Increase to R-30
Wall Insulation	Wall cavities 3½ inches or greater with no insulation	Increase to R-11
Knee Wall Insulation	If uninsulated	Increase to R-11
Duct Insulation	If less than R-5	Increase to R-11