Chapter 3
Meeting the State of Alaska's Building Energy Efficiency Standards

Statewide Regions

For the purpose of creating statewide building energy efficiency standards, Alaska is divided into five geographic and climatic areas (see map below) with minimum standards for each region.

This chapter explains the different ways to meet these standards. The standards themselves are found in Appendix A.

The traditional sod homes of the north and west coasts were constructed of driftwood, whale bones, and sod. These structures often had a below-grade entry tunnel, with an animal skin door to regulate the flow of ventilation air through a hole in the roof. These structures were often heated with a seal or whale oil lamp and body heat.

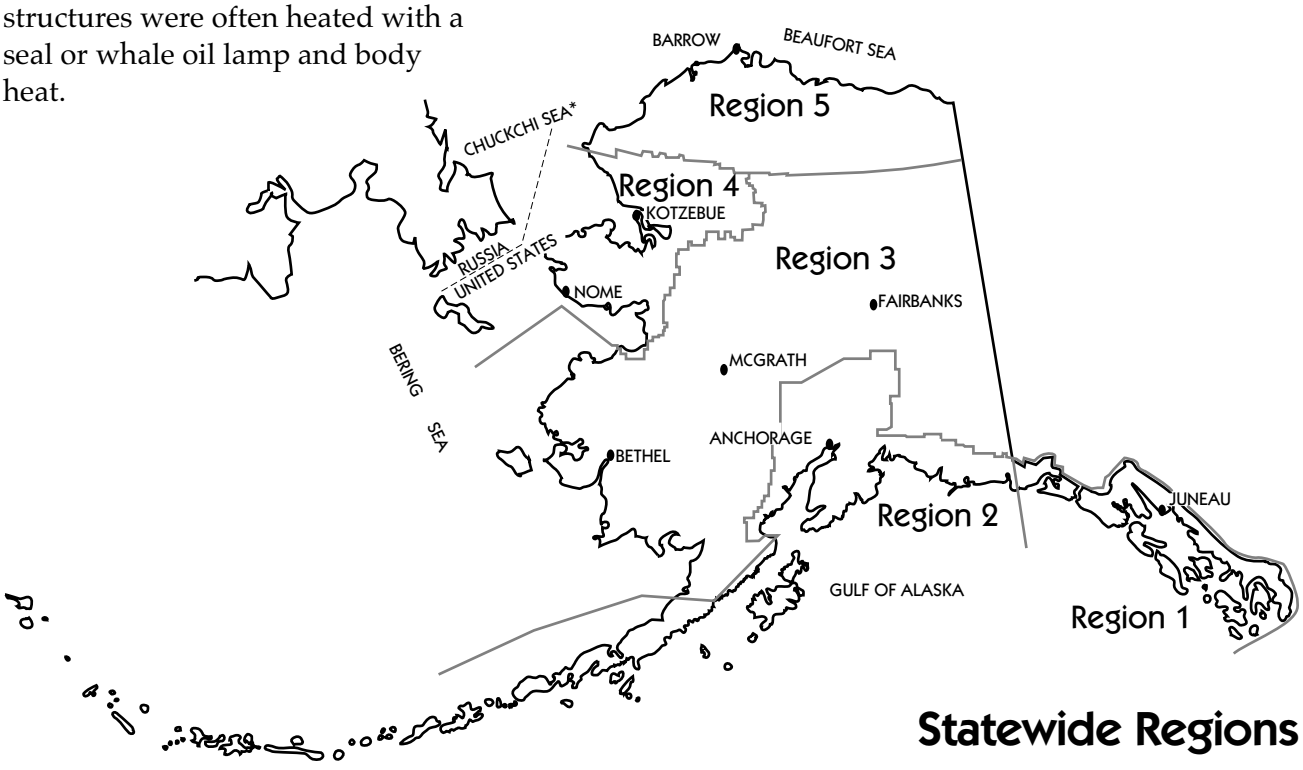
The Arctic Slope does not have any suitable trees from which to build log homes. Therefore, this manual will not include a discussion of building with logs in Region 5, the North Slope.

Four Ways to Comply With the Building Energy Efficiency Standard

There are four methods of compliance with the State of Alaska Building Energy Efficiency Standard:

1. The prescriptive method
2. The performance method
3. The building budget method
4. The energy rating method

All of the methods require minimum standards of balanced



Statewide Regions

mechanical ventilation. (See BEES Ventilation Requirements in Appendix A.)

1. Prescriptive Method

The prescriptive method requires minimum R-values for the ceiling, floor, and walls including windows and doors (Table 2). This method requires the least amount of calculation. You just have to meet or exceed the R-value requirements for all of these building components, comply with all the statewide mandatory measures outlined in chapter two of BEES, and meet the ventilation requirements. However, meeting the R-value requirements for an above-ground wall will be difficult with smaller logs.

2. Building Budget Method

The building budget method sets limits on the total amount of space heating energy used by a building. Your house is allowed to lose only a calculated amount of heat per square foot per hour. This requires a computer energy use analysis using either the HOT-2000 or AkWarm software programs. These software programs are available through AHFC.

3. Performance Method

The performance method allows the trade-off of insulation requirements between elements of a particular thermal envelope assembly, such as increasing wall insulation values to

Table 2
Prescriptive Standards

Region	Heating Fuel	Thermal Envelope R-value Requirements							
		Ceiling	Above-Grade Wall	Floor	Below-Grade Wall	Slab Floor		Window	Door*
						Basement	On Grade		
Region 1 Southeast	All Fuels	R-38	R-21	R-30	R-15	R-10	R-15	R-3	R-2.5, 7
Region 2G Southcentral	Natural Gas	R-38	R-18	R-19	R-10	R-10	R-10	R-3	R-2.5, 7
Region 2A Southcentral, Aleutian Kodiak	All Fuels Other Than Natural Gas	R-38	R-25	R-30	R-15	R-10	R-15	R-3	R-2.5, 7
Region 3 Interior & Southwest	All Fuels	R-38	R-25	R-38	R-19	R-10	R-15	R-3	R-7
Region 4 Northwest	All Fuels	R-38	R-30	R-38	R-19	R-10	R-15	R-3	R-7
Region 5 Arctic Slope	All Fuels	R-52	R-35	R-43	N/A	N/A	N/A	R-3	R-7

* Not more than one exterior door in a residential building in Region 1 or 2 may have an R-value less than 7 but not less than 2.5.

make up for north-facing windows. You are not allowed to trade off insulation values with different thermal envelope assemblies. In other words, you could not use this compliance method to reach a heat loss target by increasing the R-value of the roof insulation to make up for low wall or floor insulation values. Therefore you cannot use the performance method to make up for the lack of R-value in a log wall.

4. Energy Rated Method

The energy rated method requires that the building shall achieve at least four-star plus (83 points) on an energy rating performed by a trained and certified energy rater. This is the method most often used by builders to comply with BEES. An energy rater records the R-values of all the elements of the thermal envelope and notes the efficiency of the heating appliances, lighting, solar aspect, and other energy use considerations.

The most crucial aspect of the energy rating for the log builder is the blower door test, which uses a powerful fan to depressurize your house and accurately measure the air loss from leakage. This test also helps a builder find those leaks. Several tight log homes have qualified for a four-star plus energy rating, and a few log homes have made a five-star rating, scoring 88 points on an energy rating. A new log home in Fairbanks was recently rated five-star plus.

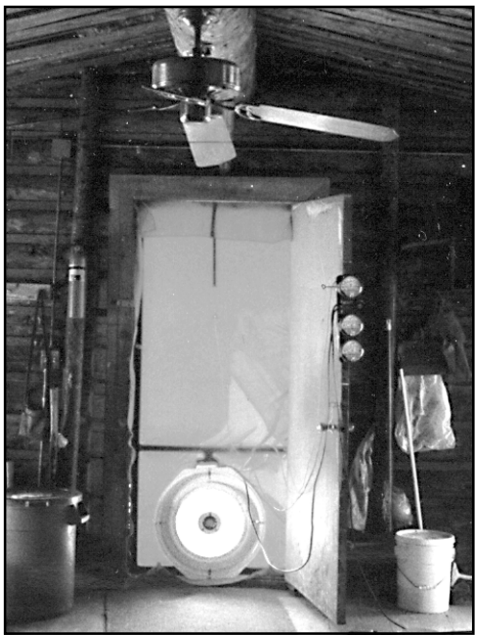


photo by Phil Loudon

Using a blower door to test the airtightness of a log home in Arctic Village.