

Alaska Housing Finance Corporation

Alaska-Specific Amendments to the IECC 2006 and ASHRAE Standard 62.2-2004

January 22, 2010

This document is a list of Alaska-specific amendments to the International Energy Code 2006, Second Printing, May 2006 (IECC 2006) and the ANSI/ASHRAE Standard 62.2-2004, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, (ASHRAE 62.2-2004) that were originally adopted by reference in 15 AAC 155.010 on November 8, 2006 and were amended on XXX XX, XXXX. It is meant to be read in conjunction with the IECC 2006 and ASHRAE Standard 62.2-2004, which may be purchased at local bookstores. The amendments are numbered and organized by the chapter and section numbers found in the IECC 2006 and ASHRAE 62.2-2004, respectively. The IECC 2006 as amended herein, including the ventilation requirements of ASHRAE Standard 62.2-2004 (as amended herein) constitute the Alaska Building Energy Efficiency Standards (BEES) and may be referred to as such. Immediately following are amendments to IECC 2006, the ASHRAE amendments are in IECC subsection 403.7:

Chapter 1 – Administration

101.4.3 Additions, alterations, renovations or repairs.

Applicability of the IECC and Alaska Specific Amendments shall be limited to new construction only for the purposes of this document, and shall not apply to additions, alterations, renovations, or repairs.

101.4.4 Changes in Occupancy.

For the purposes of this document, this section is deleted.

101.5.3 BEES Certification.

Certification that a building meets the thermal and ventilation requirements of the Alaska Building Energy Efficiency Standard (BEES) as adopted by 15 AAC 155.010 shall be provided by submission to the Alaska Housing Finance Corporation (AHFC) a completed AHFC Form PUR-101.

101.5.3.1 BEES Certification using the Energy Rating Compliance Path.

For AHFC PUR-101 certification under the energy rating (performance) path, the energy rater shall rely on inspection and documentation as specified by the AHFC Energy Rating Program provided for in Section 404.3 (Performance-based compliance).

101.5.3.2 BEES Certification using the Prescriptive Compliance Path.

For AHFC PUR-101 certification under the prescriptive path, the certifier shall rely on inspections and documentation as specified by AHFC that the building meets the mandatory and prescriptive standards as described in subsection 401.2 (Compliance).

Chapter 2 – Definitions

No amendments were made to this chapter.

CHAPTER 3 - Climate Zones

301.1 General.

IECC 2006 Figure 301.1 and Table 301.1 shall be replaced with Table A301.1, below. To determine the IECC Climate Zone for a community, find the community in the climate region list below, note the climate region number, and then find the corresponding zone in Table A303.1. Zones for urban communities may be read directly from Table A301.1.

IECC zones for Alaska	HDD ^a Range (IECC)	BEES Climate Regions	HDD ^a Range (BEES)
Zone 6	7200 - 9000	Region 1	7000-10,700
Zone 7	9000 -12,600	Region 2	8600-13,500
Zone 8 _{urban}	12,600 -16,800	Region 3&4 – Fairbanks Borough	11,300-17,700
Zone 8 _{rural}	12,600 -16,800	Region 3&4 – non-urban Interior, Southwest, & Northwest	11,300-17,700
Zone 9	16,800 -21,000	Region 5 – Arctic Slope	16,900-20,300

a. HDD = Heating Degree Day

Climate Region Lists

For consistency, these are the same regional lists as in the previous standard (BEES). In cases where the HDD for a community is significantly outside of the HDD range for the assigned IECC zone, the community may request to be placed in a more appropriate zone. Note, however, that the rural sub-zone for Zone 8 has been created to allow for the higher cost of energy away from the Fairbanks North Star Borough.

**REGION 1
SOUTHEAST**
Alder Cove
Angoon
Annette
Annex Creek
Auke Bay
Baranof
Beaver Falls
Bell Island
Canyon Island
Chenega
Chichagof
Coffman Cove
Craig
Edna Bay
Eldred Rock
Elfin Cove
Five Finger Lt

Glacier Bay
Gull Cove
Gustavus
Haines
Hollis
Hoonah
Hydaburg
Hyder
Juneau
Kake
Kasaan
Ketchikan
Klawock
Klukwan
Kupreanof
Metlakatla
Myers Chuck
Lincoln Rock
Litl Port Walter

Moose Valley
Ocean Cape
Pelican
Petersburg
Port Alexander
Port Baker
Port Protection
Saxman
Seclusion Hbr.
Sitka
Skagway
Smuggler Cove
Snettisham
Tenakee Spgs
Thorne Bay
View Cove
Wrangell
Yakutat

**REGION 2
SOUTHCENTRAL,
ALEUTIAN,
KODIAK**
Adak
Afognak
Akhiok
Akutan
Anchor Point
Anchorage
Anderson
Atka
Attu
Belkofski
Big Lake
Cape Sarichef
Caswell
Chickaloon
Chignik

Chignik Lake
Chiniak
Chulitna
Clam Gulch
Cold Bay
Cold Harbor
Cooper Lndg
Cordova
Curry
Diamond Ridge
Driftwood Bay
Dutch Harbor
Eklutna
Elmendorf
English Bay
False Pass
Fort Glenn
Fort Richardson
Girdwood
Homer
Hope
Houston
Ivanoff Bay
Kachemak
Kaguyak
Karluk
Kasilof
Kenai
King Cove
Knik
Kodiak
Kulis ANGB
Larsen Bay
Latouche
Mat. Ag. Exp.
Middleton Is.
Moose Pass
Naptowne
Nelson Lagoon
Nikiski
Ninilchik
Nikolski
Old Harbor
Ouzinkie
Palmer
Perryville
Petersville
Pillar Mountain
Portage
Port Graham
Port Heiden
Port Lions
Port Moller
Portlock
Rabbit Creek
Salamatof
Sanak
Sand Point
Sawmill

Seldovia
Seward
Shemya
Skwentna
Soldotna
Squaw Harbor
Starisky Creek
Sterling
Summit
Susitna
Sutton
Talkeetna
Tatitlek
Tahnetna Pass
Thompson Pass
Trappers Creek
Tyonek
Unalaska
Unga Island
Valdez
Wasilla
Whittier
Willow
Women's Bay
Yakataga Bay

**REGION 3
INTERIOR,
SOUTHWEST**

Akiachak
Akiak
Alakanuk
Aleknagik
Allakaket
Anderson
Aniak
Anvik
Atmaultuak
Aurora
Beaver
Beaver Creek
Bethel
Bettles
Big Delta
Big Mountain
Bill Moore's
Birch Creek
Black Rapids
Boundary
Canyon Creek
Cap.Newenham
Cape Romanzof
Cathedral Rpds
Cantwell
Central
Chalkyitsik
Chandalar
Chandalar Lake
Chatanika

Chauthbaluk
Chefornak
Chena Hot Spg
Chevak
Chicken
Chistochina
Chitina
Chuloonawick
Circle
Circle Hot Spgs
Clark's Point
Clear
Coldfoot Camp
College
Copper Center
Crooked Creek
Delta Junction
Dillingham
Donnelly
Dot Lake
Dry Creek
Eagle
Eek
Egegik
Eielson
Ekuk
Ekwok
Emmonak
Ester
Eureka
Evansville
Fairbanks
Farewell
Ferry
Flat
Fort Greeley
Fort Wainwright
Fort Yukon
Fox
Gakona
Galena
Gerstle River
Georgetown
Glennallen
Gold King Cr
Goodnews Bay
Grayling
Gulkana
Hamilton
Harding Lake
Healy
Healy Lake
Holy Cross
Hooper Bay
Hughes
Huslia
Iguigig
Illiamna
Indian Mtn

Kalskag
Kaltag
Kanatak
Kasigluk
Kennicott
Kenny Lake
King Salmon
Kipnuk
Knob Ridge
Kohkanok
Koliganek
Kongiganak
Kotlik
Koyukuk
Kwethluk
Kwigilingok
Lk.Minchumina
Lime Village
Livengood
Lower Kalskag
Lower Tonsina
Manley Hot Sp
Manokotak
Marshall
Ma Creek
McCallum
McCarthy
McGrath
McKinley Park
Medfra
Mekoryuk
Mentasta Lake
Minto
Mountain Vil.
Murphy Dome
Naknek
Napakiak
Napamiute
Napaskiak
Nebesna
Nenana
Newhalen
New Stuyahok
Newtok
Nightmute
Nikolai
Nondalton
North Pole
Northway
Northway Jct
Nulato
Nunapitchuk
Ohogamiute
Ophir
Oscarville
Paimuit
Paxson
Paxson Lake
Pedro Dome

Pilot Point
Pilot Station
Pitka's Point
Platinum
Port Alsworth
Quinhagak
Rampart
Red Devil
Richardson
Russian Mission
Ruby
Saint George
Saint Mary's
Saint Matthew
St. Paul Island
Salchaket
Scammon Bay
Shageluk
Sheldon Point
Slana
Sleetmute
Slide Mountain
South Naknek
Sparrevohn
Stevens Village
Stony River
Suntrana
Summit
Takotna
Tanacross
Tanana
Tatalina
Telida
Tetlin
Togiak
Tok
Toksook Bay
Tonsina
Tuluksak
Tununak
Tuntutuliak
Twin Hills
Ugashik
Upper Kalskag
Usibelli
Unkumiute
Venetie
Wiseman

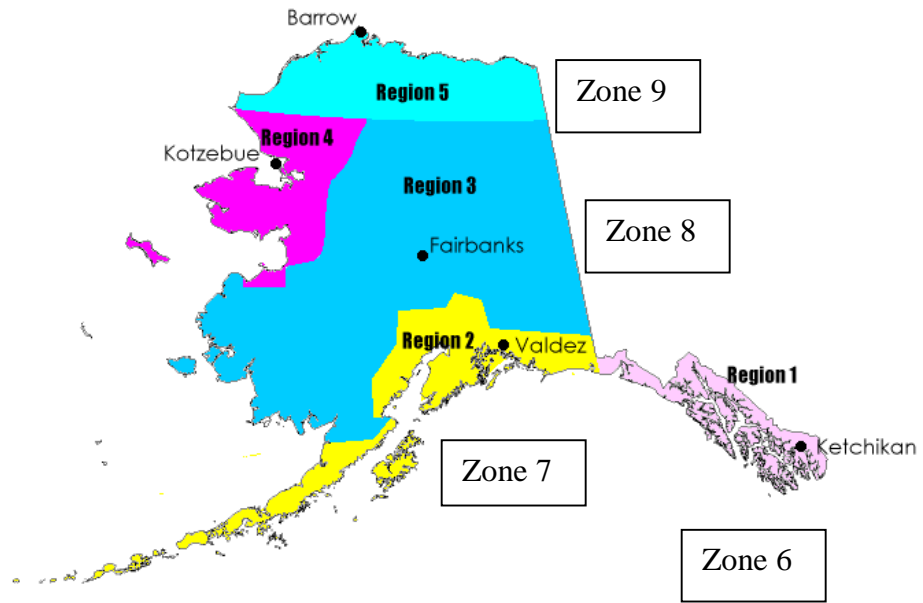
**REGION 4
NORTHWEST**

Ambler
Anvil Mountain
Brevig Mission
Buckland
Candle
Council
Deering
Diomedea
Elim

Gambell
Golovin
Granite Mtn
Haycock
Kalakaket Cr
Kiana
King Island
Kivalina
Kobuk
Kotzebue
Koyuk
Mary's Igloo
Moses Point
Noatak
Nome
Noorvik
Northeast Cape
North River
Savoonga
Selawik
Shaktolik
Shishmaref
Shungnak
Solomon
Stebbins
St. Michael
Teller
Tin City
Unalakleet
Wales
White Mountain

**REGION 5
ARCTIC SLOPE**

Anaktuvuk Pass
Arctic Village
Atkasut
Barrow
Cape Lisburne
Deadhorse
Kaktovik
Nuiqsut
Oliktok
Point Hope
Point Lay
Prudhoe Bay
Sagwon
Umiat
Wainwright



CHAPTER 4 - Residential Energy Efficiency

402.1 General. (Prescriptive).

IECC 2006 Sections 402.1 through 402.3 describe the prescriptive method for compliance and establish minimum thermal envelope insulation requirements for buildings. Exceeding these minimums is encouraged. IECC 2006 Tables 402.1.1 and 402.1.3 shall be replaced with Tables A402.1.1 and A402.1.3, respectively. In these replacement tables, only the zones applicable to Alaska are given (i.e., 6-9). These zones are defined in Chapter 3. When using the Prescriptive Method as the means of compliance, all mandatory measures specified in Section 403 shall also be accomplished.

Climate Zone	Windows & Skylights	Ceiling ^a	Exterior Frame Wall	Floor	Below Grade Wall ^b	Slab ^c & Depth	Crawl Space Wall ^b
6	3	49 or 38	20	30	15/19	15, 4ft	15/19
7	3	49 or 38	20	30	15/19	15, 4ft	15/19
8U	4	49 or 38	25	38	15/19	15, 4f	15/19
8R	4.5	49 or 38	30	38	15/19	15, 4f	15/19
9	5	65 or 52	35	43	NR	NR	NR

- The smaller value may be used with a properly sized, energy-heel truss.
- The first R-value applies to continuous insulation, the second to framing cavity insulation; either meets the requirement.
- R-5 shall be added to the required slab edge R-values for heated slabs.

Climate Zone	Windows & Skylights	Ceiling ^a	Exterior Frame Wall	Floor	Below Grade Wall ^b	Slab	Crawl Space Wall ^c
6	0.33	0.020	0.053	0.033	0.067/0.053	0.067	c
7	0.33	0.020	0.053	0.033	0.067/0.053	0.067	c
8U	0.25	0.020	0.040	0.026	0.067/0.053	0.067	c
8R	0.22	0.020	0.033	0.026	0.067/0.053	0.067	c
9	0.20	0.015	0.029	0.023	NR	NR	NR

- The larger factor of 0.0263 (0.0192 for Zone 9) may be used with a properly sized, energy-heel truss.
- The first U-factor applies to continuous insulation, the second to framing cavity insulation; either meets the requirement.
- See below grade wall factors.
- Nonglazing U-factors shall be obtained from measurement, calculation or an approved source.

402.2.1 Ceilings and attic spaces. Add at the end of the subsection: “And in a similar fashion, an uncompressed R-52 over the top plate will satisfy the requirement for R-65. In all cases, the installed insulation shall not compromise required attic ventilation clearances.”

402.2.2 Ceilings without attic spaces. Replace last sentence of subsection with “This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 450 square feet (42 m²) or 15% of ceiling area, whichever is smaller.”

402.2.3 Mass walls. Delete this subsection. [Mass walls are not a significant energy saver in Alaska; see Seifert, R.D. and George S. Mueller, June 1983, *An Analytical Study of Passive Solar Energy and Mass Storage Observations from a Test Building at Fairbanks, Alaska*, Report #AK-RD-85-21, 50 pages plus appendices, published by the State of Alaska, Department of Transportation and Public Facilities.]

402.2.5 FLOORS. At end of subsection add: “Exception: The above requirement is waived for floor systems that require space between the insulation and the floor for radiant tubing or other plumbing, ducting or wiring, provided that the required amount of floor insulation is maintained and the perimeter edges are (1) insulated to the appropriate wall R-value and (2) sealed to prevent infiltration of cold air.”

402.2.7 Slab-on-grade floors. In the second sentence, delete “or inside”.

402.2.8 Crawl space walls. Replace the second sentence with “Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then either (a) vertically down to the top of the footer, or (b) vertically down and/or horizontally outward for a total of at least 36 inches.” Move the last three sentences to section 402.5 and delete “unvented”. At end of subsection add: “Exception: This alternative is permitted if the only venting in the crawlspace is mechanical.”

402.3.6 Replacement fenestration. Delete this subsection [these requirements apply to new construction only].

402.3.6 Glazing area limitation. [New subsection] The total glazed area may not exceed 18% of the conditioned floor area using the prescriptive method.

402.3.7 Skylights. [New subsection] In very cold climates, a skylight is essentially a low-R-value hot roof that is subject to ice damming and subsequent leakage; their use is strongly discouraged unless they are carefully designed to avoid these problems. The total skylight area shall not exceed 1% of the total ceiling thermal envelope area if the prescriptive path is used. A skylight sidewall that is not an integral part of a skylight product shall be insulated to the same R-value as the ceiling.

402.4.1 Building thermal envelope. Add at end of subsection: “Optional Verification: It is recommended that the sealing of the building thermal envelope be verified to an air-tightness level of 7 ACH₅₀, or less, utilizing an AHFC-approved blower-door testing protocol, even when using the prescriptive method.

402.4.2 Fenestration air leakage. Modify Exceptions to read: “**Exceptions:** (1) site-built windows, skylights and doors, (2) products for which air infiltration data are not available on the manufacturer’s labels or at the manufacturer’s website.”

402.5 Moisture control. Add before Exceptions: “Exposed earth in crawl space foundations shall be covered with a continuous vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.” Add under Exceptions “4. A vapor retarder may be installed within the thermal insulation so long as the R-value of the thermal insulation on the warm side of the vapor retarder does not exceed one third of the total R-value. (Note that this is a statewide ~~minimum~~ maximum and more restrictive values may be needed in the colder climate zones.)”

403.1 Controls. At end of subsection add: “**Exception:** solid fuel burning devices that are not designed to be controlled with a thermostat.”

403.2.1 Insulation. Replace first two sentences with: “Locating supply and return ducts in unconditioned spaces is not recommended; however, they shall be insulated to at least the wood-frame wall R-value specified in Table A402.1.1.”

403.2.4 Duct material. [New subsection] A duct transporting ventilation air shall be constructed of a smooth-walled material, such as galvanized steel or lined fiberglass (rigid or semi-rigid), as much as possible. When necessary to use flexible ducting, it shall be supported along its full length with no sags and no bends greater than 90 degrees.

403.3 Mechanical system piping insulation. Add “Exception: piping carrying fluids above 105°F (41°C) within the thermal envelope.”

403.5 Mechanical ventilation. Add at end of first sentence: “or positive closure that can be operated by occupants.” Add second sentence: “An exterior exhaust vent shall be located to minimize exhaust air rising into an attic vent.”

403.6 Equipment sizing and installation. Add at end of subsection: “The AkWarm design heating load methodology is an approved heating calculation methodology. All heating, cooling, and ventilating equipment shall be installed in accordance with the manufacturer’s installation instructions and the requirements of this code.”

403.7 Ventilation Standard. [New subsection] Ventilation must meet the ANSI/ASHRAE Standard 62.2-2004 as amended below.

The following amendments refer to the ANSI/ASHRAE Standard 62.2-2004 and are numbered according to that standard.

Section 3 – Definitions

Add the following:

Air change rate at 50 Pascals: the *air change rate* when a pressure differential of 50 Pascals is maintained between the inside and outside of the envelope; it is commonly abbreviated as ACH₅₀.

Amend definition of “occupiable space” by adding at the end: “; does not include garages or crawl spaces”

Section 4 – Whole Building Ventilation

4.1 Ventilation Rate. Equations 4.1a and 4.1b shall be replaced by:

$$Q_{\text{fan}} = 0.01A_{\text{floor}} + 10(N_{\text{br}} + 1) \quad \text{A(4.1a)}$$

and Tables 4.1a and 4.1b shall be replaced by

Table A4.1a, Ventilation Air Requirements, cfm

Floor Area (ft ²)	Bedrooms				
	0-1	2-3	4-5	6-7	>7
<1500	35	55	75	95	115
1501-3000	50	70	90	110	125
3001-4500	65	85	105	125	145
4501-6000	80	100	120	140	160
6001-7500	95	115	135	155	175
>7500	110	130	150	170	190

where the floor area (A_{floor}) is based on the definition of occupiable space.

4.1.1 Different Occupant Density. Replace “4.1a and 4.1b” with “A4.1a”, “Equation 4.1” with “Equation A4.1”, and “7.5 cfm (3.5 L/s)” with “10 cfm.”

4.1.3 Infiltration Credit. Delete this subsection. [ASHRAE is likely to delete this section because of the confusion that it causes; in any case, it was not intended to change the amount of mechanical ventilation air required.]

4.2 System Type. Add the following two sentences after the first one: “Supply-only systems are not permitted in Alaska during the heating season. Balanced, heat-recovery ventilation systems as described in Appendix B4.5 that provide well distributed ventilation throughout the entire occupiable space are strongly recommended in Alaska.”

4.5.2 Very Cold Climates. Delete this subsection. [In Alaska supply-only ventilation during heating season is not allowed.]

6.5 Garages. Third sentence, after “located in garages” insert “are not recommended.”

6.6 Ventilation Opening Area. After the second sentence, add: “Ventilation air through an exterior door or operable window shall not be considered as part of a mechanical ventilation system design and shall not be included in proving compliance with the required minimum ventilation rate.”

6.8 Air Inlets. [New subsection under *Exceptions to 6.8*] (d) A ventilation system’s supply and exhaust vents on the exterior of a building may be separated less than 10 feet as long as they are separated a minimum of 6 feet horizontally. They may be separated less than this if they are part of a system engineered to prevent entrainment of the exhaust air. Care should be taken to locate an intake vent where it can be easily cleaned at regular intervals.

7.1 Selection and Installation. Add at end of subsection: “A ventilation appliance ~~should not be located in a space that is difficult or inconvenient to access such as a crawl space or attic if the appliance requires~~ shall be located in a place that is accessible and convenient to access for annual or more frequent maintenance (changing of filters, oiling, cleaning, etc.).

B4.4 Exhaust Ventilation. Add at the end of subsection, “In very cold climates, intakes that do not temper the incoming ventilation air have proven sufficiently problematic, that their use is strongly discouraged.”

B4.7 Distribution and Circulation of Supply Air. [New subsection] A ventilation system should be designed and installed to uniformly mix and circulate supply air throughout the occupiable space. Supply air should be introduced into a room in a manner that does not create human discomfort and is not potentially damaging to the building. There should be adequate air circulation into and out of a room at all times. A door or transom louver, undercut door, wall transfer fan, return grille or other means should be used.

This is the end of the ANSI/ASHRAE Standard 62.2-2004 amendments.

IECC Section 404 - Simulated Performance Alternative (Energy Rating Method)

404.3 Performance-based compliance. Replace this subsection with following:

Compliance with this code may be shown through a home energy rating under a program approved by the Alaska Housing Finance Corporation (AHFC) that meets the following requirements:

- a) At least a Four Star plus rating to qualify.
- b) An air-tightness level of 7 ACH₅₀, or less, utilizing an AHFC-approved blower-door testing protocol.
- c) Only a person authorized by AHFC shall submit a rating for compliance. A copy of the energy rating shall be provided to AHFC officials. (A list of authorized home energy raters may be obtained from AHFC, Research Information Center.)

Delete the remainder of this section (404.4 – 404.6.3).

Chapter 5 - Commercial Energy Efficiency

Delete chapter 5. (Alaska Statute 46.11.040 and AHFC regulations 15 AAC 155.010 - 15 AAC 155.030 only apply to residential buildings.)

Chapter 6 – Referenced Standards

Add to the ASHRAE section: “62.2-2004 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.”