

A BILL FOR AN ORDINANCE AMENDING CHAPTER 12, ARTICLE 6, OF THE  
KAUAI COUNTY CODE-1987 RELATING TO THE ENERGY CODE

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BE IT ORDAINED BY THE COUNCIL OF THE COUNTY OF KAUAI, STATE OF HAWAII:

SECTION 1. Chapter 12, Article 6 of the Kauai County Code-1987, as amended, is hereby amended to read as follows and all other and prior ordinances or parts of ordinances in conflict herewith are hereby repealed.

**ARTICLE 6. ENERGY CODE**

**Section 12-6.1 Purpose.**

This ordinance is for the purpose of adoption and incorporation by reference the 2009 Edition of the International Energy Conservation Code as the Energy Code; providing amendments thereto, regulating the construction, alteration or equipment of buildings or structures in the County of Kauai. This code will recognize the need for a modern, up-to-date energy conservation code that addresses the design of energy-efficient building envelopes and installation of energy efficient mechanical, lighting and power system through requirement emphasizing performance.

**Section 12-6.2 Title.**

This Article shall be known as the Energy Code of the County of Kauai, and may be cited as the "Energy Code."

**Section 12-6.3 Adoption of the International Energy Conservation Code.**

The International Energy Conservation Code (IECC), 2009 Edition as copyrighted and published in 2009 by the International Code Council, Incorporated, 4051 West Flossmoor Road, County Club Hills, Illinois, 60478-5795, is by reference incorporated herein and made a part hereof as the Energy Code, subject to the following amendments.

**Section 12-6.4 Local Amendments to the IECC.**

- (1) Amending Section 101.1. Section 101.1 is amended to read as follows:

**101.1 Title.** This code shall be known as the Energy Conservation Code of the County of Kauai, and shall be cited as such. It is referred to herein as "this code."

- (2) Amending Section 101.2. Section 101.2 is amended to read as follows:

**101.2 Scope.** This code applies to residential and commercial buildings. It sets forth the minimum requirement for design and construction of buildings for the effective uses of energy and is intended to provide flexibility to all the use of innovative approaches and techniques to achieve the effective use of energy.

(3) Amending Section 101.5.2. Section 101.5.2 is amended to read as follows:

**101.5.2 Low energy buildings.** The following buildings, or portions thereof, separated from the remainder of the building by building thermal envelope assemblies complying with this code shall be exempt from the building thermal envelope provisions of this code:

1. Conditioned spaces with a peak design rate of energy usage less than 3.4 Btu/h ft<sup>2</sup> (10.7 W/m<sup>2</sup>) or 1.0 watt/ft<sup>2</sup> (10.7 W/m<sup>2</sup>) of floor area for space conditioning purposes.

2. Unconditioned spaces that are non-habitable spaces.

3. Unconditioned habitable spaces are exempt from wall insulation requirements of the building thermal envelope provisions.

(4) Amending Section 103.1. Section 103.1 is amended to read as follows:

**103.1 General.** Plans, specifications and necessary computations shall be submitted to indicate compliance with this code. Plans, specifications, and necessary computations for work to comply with this code shall be prepared, designed, approved, certified, and stamped by a duly registered licensed professional as required by Chapter 464 of the Hawaii Revised Statutes, for the following work:

(A) All electrical power, equipment and lighting requirements shall be completed and certified by an electrical engineer.

(B) All requirements of heating, ventilating, air conditioning systems and equipment, service water heating systems and equipment shall be completed and certified by a mechanical engineer.

(C) For all elements of building envelope and building performance requirements shall be completed and certified by an architect or mechanical engineer.

**EXCEPTION:** A duly registered professional architect may prepare, design, approve, certify and stamp the following plans, specifications and necessary computations when any of the following conditions are complied with.

(1) Lighting and/or electrical plans when the total load of all electrical work shall not exceed 35 kilo-volt amperes.

(2) Mechanical plans when the building or structure is heated, ventilated, or equipped and cooled with an air conditioning system with a total capacity of not more than 60,000 BTU/Hr.

Specifications and necessary computations need not be submitted when authorized by the Building Official.

- (5) Amending Section 103.3.1. Section 103.3.1 is amended to read as follows:

**103.3.1 Approval of construction documents.** When the building official issues the permit, he shall affix an official stamp of approval to the specifications and each sheet of the Job Site Copy of the plans. Such approved plans and specifications shall not be changed, modified, or altered without authorization from the Building Official and all work shall be done in accordance with the approved plans. The building permit shall be posted in a conspicuous place on the site during the progress of work.

One (1) set of approved plans shall be retained by the Building Official as the official records, one set of approved plans shall be returned to the applicant as the approved Job Site Copy, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.

- (6) Deleted Sections 103.3.2 and 103.3.3. Sections 103.3.2 and 103.3.3 deleted.

- (7) Amending Section 103.5. Section 103.5 is amended to read as follows:

**103.5 Retention of construction documents.** One (1) set of approved construction documents shall be retained by the code official as required by Chapter 12, Building Code, K.C.C. 1987 as amended.

- (8) Amending Section 104.4. Section 104.4 is amended to read as follows:

**104.4 Reinspections.** A reinspection fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made.

This section is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for such inspection or reinspection.

Reinspection fees may be assessed when the building permit card is not posted or otherwise available on the work site, the approved plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, or for deviating from plans requiring the approval of the building official.

To obtain reinspection, the applicant shall file an application thereof in writing on a form furnished by the building official and pay the reinspection fee of fifty dollars (\$50.00) for each additional inspection.

In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

- (9) Amending Section 104.5. Section 104.5 is amended to read as follows:

**104.5 Approved inspection agencies.** The code official is authorized to accept inspections of approved special inspection agencies, provided such agencies meets the qualifications and reliability requirements and complies with special inspections accordingly to Chapter 12, Building Code, K.C.C. 1987 as amended.

- (10) Deleted Section 104.7. Section 104.7 is deleted.

- (11) Amending Section 104.8. Section 104.8 is amended to read as follows:

**104.8 Approval.** After required inspections indicate that the work complies in all respects with this code, a notice of inspection or certificate of occupance shall be issued by the code official.

- (12) Amending the entire Section 107. The entire Section 107 is amended to read as follows:

#### **SECTION 107 FEES**

**107.1 Fees.** If the work described in an application for a permit and the plans filed therewith conform to the requirements of Chapter 12, Building Code, K.C.C., 1987 as amended, and other pertinent laws and ordinances, the code official shall issue a permit therefore to the owner. Payment for any permit fee shall be paid upon the issuance of such permit. All requirements for permit fee shall comply with the requirements of the Building Code.

- (13) Amending the entire Section 108. The entire Section 108 is amended to read as follows:

#### **SECTION 108 STOP WORK ORDER**

**108.1 Authority.** Whenever the code official finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the code official is authorized to issue a stop work order and all such order shall comply with the requirements of Chapter 12, Building Code, K.C.C., 1987 as amended.

- (14) Amending the entire Section 109. The entire Section 109 is amended to read as follows:

**SECTION 109  
BOARD OF APPEALS**

**109.1 General.** The Board of Appeals shall hear and decide cases of appeals, orders, decisions, or determinations made by the code official relative to the application and interpretation of this code. All cases of appeals shall comply with the requirements of Chapter 12, Building Code, K.C.C., 1987, as amended.

- (15) Adding Section 110. Section 110 is added to read as follows:

**SECTION 110  
VIOLATION AND PENALTIES.**

**110.1 General.** All violations and penalties relative to this code shall comply with the requirements of Chapter 12, Building Code, K.C.C. 1987, as amended.

- (16) Amending Section 202. Section 202 is amended to read as follows:

The following paragraph is added after the definition of "BUILDING THERMAL ENVELOPE"

**CERTIFICATION.** As used herein, the word certify shall mean an expression of the licensed professional's opinion to the best of its information, knowledge, and belief, and does not constitute a warranty or guarantee.

The following paragraphs are added after the definition of "HUMIDISTAT."

**ICC.** Means the International Code Council.

**IECC.** Means the ICC, International Energy Conservation Code, as copyrighted by the International Code Council.

The following paragraph is added after the definition of "SCREW LAMP HOLDERS."

**SECTION.** Means a section of a chapter of the International Energy Conservation Code.

- (17) Amending Section 401.3. The first sentence of Section 401.3 is amended to read as follows:

When required by the code official, a permanent certificate shall be posted on or in the electrical distribution panel.

- (18) Adding Section 402.1.1.1 to Section 402.1.1.8.1. Sections 402.1.1.1 to Section 402.1.1.8.1 are added to read as follows:

**402.1.1.1 Ceiling insulation alternative.** Insulation requirements for ceilings in unconditional habitable spaces constructed in climate zone one (1) shall meet one (1) of the design options in Table 402.1.1.1.

**402.1.1.2 Definitions.** For the purpose of this section, the following terms shall be defined as follows:

**GROSS AREA OF OPAQUE ROOF SURFACES.** Gross area of opaque roof surfaces means the total surface of the roof assembly exposed to outside air or unconditioned spaces. The opaque roof assembly shall exclude skylight surfaces, service openings, and overhangs.

**NET FREE VENT AREA.** Net free vent area means the total area through which air can pass in a screen, grille face or register.

**ROOF AREA.** Roof area means attic floor area; or, if there is no attic, "roof area" means the horizontal projection of a roof area measured from the outside surface of the exterior wall.

**402.1.1.3 Construction Documents.** Plans shall be submitted which indicate insulation type, thickness, and location; ventilation opening types, sizes and locations; radiant barrier location; and roof surface type as appropriate, depending on the option selected from Table 402.1.1.1.

**402.1.1.4 Roof insulation.** Roof insulation for unconditioned habitable spaces shall be provided as follows:

1. In buildings with an attic space provide either:
  - 1.1. R-30 insulation installed above the ceiling level, or
  - 1.2. R-19 insulation installed at the roof level between the roof framing members.
2. In buildings without an attic space provide either:
  - 2.1. R-19 insulation installed at the roof level between the roof framing members, or
  - 2.2. R-15 entirely above the roof deck.

**402.1.1.5 Ventilation.** Ventilation shall be provided by at least one (1) of the following:

1. A baffled ridge vent installed in accordance with manufacturer's instructions in addition to lower inlet openings to provide a total of no less than one (1) square foot of net free vent area for each 300 square feet of roof area. No less than 30 percent of the total vent area shall be in either the ridge vent or the lower half of the ventilated space.
2. A solar-powered exhaust fan that provides at least one (1) cubic foot per minute of airflow for each square foot of roof area.

3. Upper and lower vents with total net free vent area of at least one (1) square foot for each 150 square feet of roof area. At least 30 percent of the total vent area shall be in the upper of the ventilated space and at least 30 percent of the total vent area shall be in the lower half of the ventilated space.

**402.1.1.6 Radiant Barrier.** A radiant barrier shall have an emissivity of no greater than 0.05 as tested in accordance with ASTM E-408. The radiant barrier shall be installed with the shiny side facing down and with a minimum air gap thickness of ¼-inch below. The radiant barrier may be securely attached to the roof framing or may be laminated to the bottom of the roof sheathing.

**402.1.1.7 Cool Roof.** A cool roof shall have an infrared emittance of no less than 0.75 when tested in accordance with ASTM E-408 and a high solar reflectance. The manufacturer's test results shall be acceptable for compliance.

**402.1.1.8 Roof Heat Gain Factor.** The Roof Heat Gain Factor (RHGF) shall not exceed 0.05 when calculated as described in Equation 402.1.1-1.

**Equation 402.1.1-1**

$$RHGF = U_r \times a \times RB$$

Where:

RHGF = Roof Heat Gain Factor (Btu/ft<sup>2</sup>-h-°F)

U<sub>r</sub> = overall thermal transmittance value for the gross area of opaque roof surfaces (Btu/ft<sup>2</sup>-h-°F)

a = roof surface absorptivity. Between 0.3 and 1.0 (unitless)

RB = Radiant Barrier credit. Equals 0.33 if a radiant barrier is installed and 1.00 otherwise (unitless). Radiant barrier installation must comply with Section 402.1.1.7.1 to qualify for Radiant Barrier credit.

**402.1.1.8.1 Radiant Barrier Credit.** To qualify for the radiant barrier credit (RB) described in Section 402.1.1.8, the installation of the radiant barrier must meet the following criteria:

1. The emissivity of the radiant barrier must be 0.10 or less. The manufacturer must provide test data or documentation of the emissivity as tested in accordance with ASTM E-408.

2. The radiant barrier must be securely installed in a permanent manner using one of the following installation methods.

2.1. The radiant barrier shall be draped with the shiny side facing down over the top cord of the truss before the roof deck is installed. A minimum air gap of ¼-inch must be provided between the radiant barrier and the roof deck above at the center of the span. A minimum ¼-inch air gap must also be provided between the radiant barrier and the ceiling or insulation below.

2.2. The radiant barrier shall be stretched with the shiny side facing down between the top cords of the truss and stapled or otherwise secured at each side. A minimum air space of ¼-inch above and below is required.

2.3. For attic installations only, the radiant barrier shall be stapled or otherwise secured to the bottom surface of the top cord of the truss and draped below with the shiny side facing down. A minimum air space of ¼-inch above and below is required.

2.4. For open beam ceiling construction only, the radiant barrier shall be laid on top of the roof deck with the shiny side facing up and a minimum ¼-inch air gap between the radiant barrier and the roofing material above. The roof slope must be greater than or equal to 14° from horizontal.

3. At least one (1) square foot of free area for ventilation shall be provided per 150 square feet of attic floor area, or in the case of vaulted or open beam ceilings, per 150 square feet of ceiling area. In vaulted or open beam ceilings, the air space shall be vented with vent area approximately evenly distributed between the top and bottom. In vaulted ceiling, vents shall be provided for each air space between rafters.

(19) Amending Table 402.1.1. Table 402.1.1 is amended to read as follows:

**TABLE 402.1.1  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT**

Climate Zone	Fenestration U-Factor	Skylight <sup>b</sup> U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement <sup>c</sup> Wall R-Value	Slab <sup>d</sup> R-Value & Depth	Crawl Space Wall R-Value
1	1.20	0.75	0.30	See Section 402.1.1.1	13	3	NR	NR	NR	NR
2	0.75	0.75	0.30	30	13	4	13	0	0	0
3	0.65	0.65	0.30 <sup>e</sup>	30	13	5	19	0	0	5 / 13
4 except Marine	0.40	0.60	NR	38	13	5	19	10 / 13	10, 2 ft	10 / 13
5 and Marine 4	0.35	0.60	NR	38	19 or 13+5 <sup>e</sup>	13	30 <sup>f</sup>	10 / 13	10, 2 ft	10 / 13
6	0.35	0.60	NR	49	19 or 13+5 <sup>e</sup>	15	30 <sup>f</sup>	10 / 13	10, 4 ft	10 / 13
7 and 8	0.35	0.60	NR	49	21	19	30 <sup>f</sup>	10 / 13	10, 4 ft	10 / 13

For SI: 1 foot = 304.8 mm.

NR = No Requirement.

a. R-values are minimums. U-factors and SHGC are maximums. R-1 shall be permitted to be compressed into a 2 x 6 cavity.

b. The Fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. The first R-value applies to continuous insulation. The second to framing cavity insulation; either insulation meets the requirements.

d. R-5 shall be added to the required slab edge R-value for heated slabs.

e. There are no SHGC requirements in the Marine zone.

f. Or insulation sufficient to fill the framing cavity, R-19 minimum.

g. "13=5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.



(20) Adding Table 402.1.1.1. Table 402.1.1.1 is added to read as follows:

**TABLE 402.1.1.1  
CEILING INSULATION ALTERNATIVE**

Design Option	Design and Construction Components				
	Roof Insulation (Section 402.1.1.4)	Attic Ventilation (Section 402.1.1.5)	Radiant Barrier (Section 402.1.1.6)	Cool Roof (Section 402.1.1.7)	Roof Heat Gain Factor below 0.05 (Section 402.1.1.8)
1	R				
2 <sup>a</sup>		R	R		
3 <sup>a</sup>			R	R	
4 <sup>a</sup>					R

R = Required

Design Option is not allowed at building sites above a 2,400-foot elevation.

(21) Amending Table 402.1.3. Table 402.1.3 is amended to read as follows:

**TABLE 402.1.3  
EQUIVALENT U-FACTORS<sup>a</sup>**

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.2	0.75	0.035	0.082	0.197	NR	NR	NR
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
except Marine								
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.06	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

NR = No Requirement

Nonfenestration U-Factors shall be obtained from measurement, calculation or an approved source.

(22) Amending Section 402.3.3. Section 402.3.3 is amended read as follows:

**402.3.3 Glazed fenestration exemption.** Up to 15 square feet (1.4m<sup>2</sup>) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1. North-facing windows and windows with a projection factor of 1.0 or more shall be permitted to be exempt for SHGC requirements in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. SHGC requirement for jalousie windows shall be 0.65.

(23) Adding Section 402.4.1.1. Section 402.4.1.1 is added to read as follows:

**402.4.1.1 Unconditioned building exemption.**  
Unconditioned residential buildings are exempt from compliance with Section 402.4. The free-vent fenestration area of unconditioned buildings shall be no less than 14% of the floor area. All interior doors shall be capable of being secured in the open position and ceiling fan stub-ins shall be provided to living areas and bedrooms.

(24) Amending Section 402.4.4. The Exceptions in Section 402.4.4 are amended to read as follows:

**Exceptions:**

1. Site-built windows, skylight and doors.
2. Jalousie windows shall not exceed 1.2 cfm per square foot (6.1 L/s/m<sup>2</sup>).

(25) Amending Section 405.3. Section 405.3 is amended to add the following Exception:

For unconditioned habitable spaces compliance may be based on resistance to heat gain. Compliance based on heat gain requires that the proposed design be shown to have an annual heat gain that is less than or equal to the annual heat gain of the *standard reference design*.

(26) Amending Section 503.2.9. Entire Section 503.2.9 is amended to read as follows:

**503.2.9 Mechanical system commissioning and completion requirements.** Prior to the issuance of certificate of occupancy, the design professional shall provide a written statement of system completion in accordance with Section 503.2.9.1 through 503.2.9.2.

**503.2.9.1 System commissioning.** Commissioning is a process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents. Drawing notes shall require commissioning and completion requirements in accordance with the section. Drawing notes may refer to specifications for further requirements. Copies of all documentation shall be given to the owner.

**503.2.9.1.1 Commissioning plan.** A commissioning plan shall include as a minimum the following items:

1. A detailed explanation of the original owner's project requirements.
2. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed.
3. Equipment and systems to be tested, including the extent of tests.
4. Functions to be tested (for example calibration, economizer control, etc.).

5. Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air, etc.), and
6. Measurable criteria for acceptable performance.

**503.2.9.2 Systems adjusting and balancing.** All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates. Test and balance activities shall include as a minimum the following items:

1. Air systems balancing: Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, fan speed shall be adjusted to meet design flow conditions.

**Exception:** Fan with fan motors of 1 hp or less.

2. Hydronic systems balancing: Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

**Exceptions:**

1. Pumps with pump motors of 5 hp or less.
2. When the throttling result is no greater than 5% of the nameplate horsepower draw above that required if the impeller were trimmed.

(27) Amending Chapter 6. Chapter 6 Referenced Standards is amended by adding the following reference to ASTM Standards to read as follows:

ASTM E 408-2008, Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection Meter Techniques .....  
402.1.1.6, 402.1.1.7, 402.1.1.8.1.”

**SECTION 2.** If any provision of this ordinance or the application thereof to any person, persons, or circumstances is held invalid, the invalidity does not affect the other provisions or applications of the ordinance which can be given effect without the invalid provision or application, and to this end, the provisions of this ordinance are severable.

**SECTION 3.** Ordinance material to be repealed is bracketed. New ordinance material is underscored.

SECTION 4. This ordinance shall take effect 120 days after the date of approval, but nothing in this ordinance shall be construed to prohibit any person from complying with the provisions of the new code and amendments thereto adopted hereunder prior to enactment of this ordinance.

INTRODUCED BY:

/s/ TIM BYNUM  
(By Request)

DATE OF INTRODUCTION:

**October 21, 2009**


Lihu'e, Kaua'i, Hawai'i

CERTIFICATE OF THE COUNTY CLERK

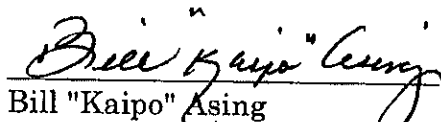
I hereby certify that heretofore attached is a true and correct copy of Bill No. 2332, Draft 2, which was adopted on second and final reading by the Council of the County of Kauai at its meeting held on January 21, 2010, by the following vote:

FOR ADOPTION: Bynum, Chang, Kaneshiro, Kawahara, Kawakami, Asing	TOTAL - 6,
AGAINST ADOPTION: None	TOTAL - 0,
EXCUSED & NOT VOTING: None	TOTAL - 0
RECUSED & NOT VOTING: Furfaro	TOTAL - 1.

Līhu'e, Hawai'i  
January 22, 2010

  
Peter A. Nakamura  
County Clerk, County of Kaua'i

ATTEST:

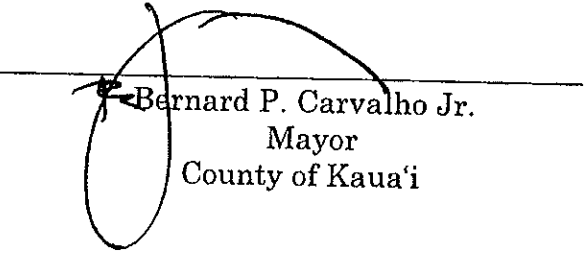
  
Bill "Kaipo" Asing  
Chairman & Presiding Officer

DATE OF TRANSMITTAL TO MAYOR:

January 25, 2010

Approved this 26 day of

January, 2010.

  
Bernard P. Carvalho Jr.  
Mayor  
County of Kaua'i

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