# Key changes to Hawai'i's commercial energy code



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# 2015 Hawai'i Energy Code for Commercial Construction and Renovation

The 2015 Hawai'i Energy Code (HEC) supports Hawai'i's journey to 100% clean energy by updating the existing conservation code to provide greater energy savings. This document highlights the key changes in the code for commercial construction and renovation. All citations refer to the 2015 International Energy Conservation Code (IECC) as amended for Hawai'i. This document is not an exhaustive review of the required energy code—please refer to the full 2015 HEC (HAR Chapter 3-181.1) for compliance purposes. More information can be found at HawaiiEnergy.com.

## **BUILDING ENVELOPE REQUIREMENTS**

#### **Roof Solar Reflectance**

Low-sloped roofs must comply with the cool roof requirements Table C402.3 and meet the minimum reflectance requirements of 0.55.

#### TABLE C402.3: MINIMUM ROOF REFLECTANCE AND EMITTANCE OPTIONS

Three-year aged solar reflectance of 0.55 and 30-year aged thermal emittance of 0.75

Three-year aged solar reflectance index of 64.

See the complete 2015 IECC Table 402.3 for specific details of these options.



#### Insulation Level

Table C402.1.3 shows the specific insulation requirements.

#### TABLE C402.1.3: OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, *R*-VALUE METHOD

Code Year	2006	2015		
	All Other	All Other	Group R	
Roofs				
Insulation entirely above roof deck	R-15 ci	R-20ci	R-25ci	
Metal buildings	R-19 + R-10	R-19 + R-11 LS	R-19 + R-11 LS	
Attic and other	R-30	R-38	R-38	
Walls, above grade				
Mass	NR	R-5.7ci	R-5.7ci	
Metal building	R-13	R-13 + R-6.5ci	R-13 + R-6.5ci	
Metal framed	R-13	R-13 + R-5ci	R-13 + R-5ci	
Wood framed and other	R-13	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	
Opaque doors				
Nonswinging	N/A	R-4.75	R-4.75	
Swinging	U – 0.70	N/A	N/A	
Roll-up or sliding	U – 1.45	N/A	N/A	

#### Minimum Skylight Area

In enclosed spaces > 2,500 ft<sup>2</sup>, skylights must create a daylight zone greater than half of the floor area. See section C402.4.2 for details.



Interior view showing daylight zone

#### **Fenestration Requirements**

The 2015 HEC has new *U*-factor, solar heat gain coefficient (SHGC), and projection factor (PF) requirements. See Table C402.4.

#### TABLE C402.4: BUILDING ENVELOPE FENESTRATION MAXIMUM, U-FACTOR, AND SHGC REQUIREMENTS

Code Year	2006	2015		
Vertical Fenestration				
U-factor				
Fixed fenestration	1.20	0.50		
Operable fenestration	1.20	0.65		
Entrance doors	1.20	1.10		
SHGC				
Orientation		SEW/N*		
PF < 0.25	0.25	N/A		
PF < 0.2	N/A	0.25/0.33		
0.25 ≤ PF < 0.5	0.33	N/A		
0.2 ≤ PF < 0.5	N/A	0.30/0.37		
PF ≥ 0.5	0.40	0.40/0.40		
Skylights				
Glass				
<i>U</i> -Factor	1.60	0.75		
SHGC	0.40	0.35		
Plastic				
<i>U</i> -Factor	1.90	0.75		
SHGC	0.35	0.35		

\* South, East, West / North

#### Increased Vertical Fenestration Area

If daylight responsive controls are installed, the allowed vertical fenestration area can increase from 30% Window Wall Ratio (WWR) to 40% WWR. See C402.4.1.1.

#### Area-Weighted Average SHGC

The 2015 HEC now allows an area-weighted average of fenestration products to satisfy SHGC requirements (C402.3.5).

#### Air Barrier

Sections C402.5.1 and C402.5.1.1 present all of the different air barrier compliance options.

Placement is allowed:

- inside building envelope;
- outside of building envelope;
- within assemblies composing envelope; or
- any combination thereof.

# MECHANICAL REQUIREMENTS

#### **Updated Performance Requirements**

Mechanical equipment must meet the new performance requirements established in C403.2.3. The minimum efficiency requirements have been updated to meet the federal minimum standards.

## System Controls

Thermostat and off-hour controls have not changed. There are, however, new requirements for door switches. C403.2.4.2.4 requires set-point reset switches for opaque and glass doors opening to the outdoors.

#### Commissioning

Mechanical commissioning applies to buildings with a total building equipment capacity  $\geq$  480,000 Btu/h cooling capacity. See C403.2.11 for specific requirements.

# SUB-METERING

New HEC 2015 section C405.10 requires metering to be collected in new buildings for the entire building and individually for each tenant occupying 1,000 ft<sup>2</sup> (total enclosed and unenclosed) or more. Tenants shall have access to data collected for their space.

# LIGHTING

## **Lighting Controls**

In addition to the existing lighting control requirements, section C405.2 provides additional requirements for occupancy controls, bi-level switching, and additional timers.

## Lighting Power Density Requirements

Two compliance methods are available for the lighting power reduction requirements: Space-by-Space and Building-Area Method. These are detailed in section C405.4.2.

# **Daylighting Controls**

Section C405.2.3 requires daylight-responsive controls to be provided to control electric lights within daylight zones in:

- spaces with total of more than 150W of general lighting within sidelight daylight zones; and
- spaces with total of more than 150W of general lighting within toplight daylight zones.

# ADDITIONAL EFFICIENCY PACKAGES

Section C406.1 requires that one of six options be included in addition to the mandatory requirements. Many of these packages are more stringent versions of typical compliance options. See Section C406.1.

- 1. Installing an air conditioning system that is 10% more efficient than the prescriptive requirements.
- 2. Installing a lighting system that has a lighting power density 10% less than the prescriptive requirements.
- 3. Installing lighting controls that use a digital system, which allows for enhanced features, such as each luminaire being addressed individually.
- 4. Installing an onsite supply of renewable energy.
- 5. Designing the HVAC system with a dedicated outdoor air system.
- 6. Certain building types are able to comply by installing either a waste heat recovery or solar water heating system on the building.





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