

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments



SUPPLEMENTAL COUNTY CHECKLISTS

This checklist covers requirements of the 2015 IECC with State-adopted amendments. Supplemental checklists are available that identify requirements that are different in County-adopted versions of the code. See <https://energy.hawaii.gov/hawaii-energy-building-code>

SCOPE

Commercial and high-rise residential buildings. More specifically, all buildings except detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane. The code applies to new construction, additions and alterations. See a separate Residential Checklist for low-rise residential buildings.

COMMERCIAL COMPLIANCE OPTIONS

Prescriptive	Total Building Performance Alternative	ASHRAE Standard 90.1-2013
Separate requirements for envelope, mechanical systems, water heating systems, lighting and electrical systems. Also includes “additional efficiency” requirements.	Simulated energy performance analysis for heating, cooling, lighting and SHW. Proposed design must have annual energy cost less than or equal to energy cost of reference design.	Includes both prescriptive and performance compliance options.
See Prescriptive Checklist below	See code Section C407	See separate standard, available from www.ashrae.org

CHECKLIST CONTENTS

PAGE

Envelope	2
Mechanical system	5
Service water heating	8
Lighting and electrical	10
Additional efficiency	14
Additions	16
Alterations	18

Sponsor: State of Hawaii, Department of Business, Economic Development and Tourism

Acknowledgment: This material is based upon work supported by the Department of Energy under Award Number EE0006986

Disclaimer: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the State of Hawaii, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, the State of Hawaii or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government, the State of Hawaii or any agency thereof.

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments

ENVELOPE REQUIREMENTS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
ENVELOPE REQUIREMENTS				
Certification	Responsible design professional certification on plans	C103.1*		<input type="checkbox"/> Signed statement on plans
Construction documents	Include: <ul style="list-style-type: none"> ▪ Insulation R-values ▪ Fenestration U-factors and solar heat gain coefficients (SHGCs) 	C103.2		
Roof – insulation above deck	<input type="checkbox"/> R-25 or U-0.039 (group R) <input type="checkbox"/> R-20 or U-0.048 (others)	C402.1, C402.2	Typically foam board on the roof deck. If tapered, R-value in some areas can be lower than the requirement if designer shows that weighted-average U-factor complies.	<input type="checkbox"/> Insulation location on plans <input type="checkbox"/> Insulation R-value on plans
Roof – metal building	R-19 + R-11 or U-0.044 (with thermal block and liner system)	C402.1, C402.2	Typically two layers of batt insulation. One parallel to and between purlins supported by fabric liner. The second draped over purlins and compressed when roof deck is installed. Also with R-5 foam block between purlins and metal roof deck.	<input type="checkbox"/> Insulation R-value on plans <input type="checkbox"/> Thermal block indicated on plans
Roof – attic or other	R-38 or U-0.027	C402.1, C402.2	This category includes attics, cathedral ceilings, and insulation installed under the roof deck. Insulation on top of suspended ceiling is not allowed for compliance.	<input type="checkbox"/> Insulation location on plans <input type="checkbox"/> Insulation R-value on plans
Wall – mass (CMU or concrete)	R-5.7 or U-0.151	C402.1, C402.2	Requires either exterior or interior insulation. CMU integral insulation does not comply.	<input type="checkbox"/> Insulation location on plans <input type="checkbox"/> Insulation R-value on plans
Wall – metal building	R-13 + R6.5 or U-0.079	C402.1, C402.2	Typically two layers of batt insulation. One installed horizontally between girts. The second layer draped outside the girts and compressed as the wall panel is installed.	<input type="checkbox"/> Insulation shown on plans <input type="checkbox"/> Insulation R-value on plans
Wall – metal frame	R-13 + R-5 or U-0.077 (R-5 not required with reflectance ≥ 0.64 or shading $PF \geq 0.3$)*	C402.1, C402.2*	Requires insulation in framing cavity plus a layer of continuous insulation (typically foam board). Cavity insulation complies on its own with shading or high reflectance.	<input type="checkbox"/> Insulation location on plans <input type="checkbox"/> Insulation R-value on plans <input type="checkbox"/> Shading or wall reflectance shown (if exception is applied)

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Wall – wood frame and other	R-13 + R3.8 or R-20 or U-0.064 (R-3.8 not required with reflectance ≥ 0.64 or shading $PF \geq 0.3$)*	C402.1, C402.2*	2x4 requires cavity insulation plus continuous insulation (with exception for shading or high reflectance). 2x6 OK with R-20 cavity insulation.	<input type="checkbox"/> Insulation location on plans <input type="checkbox"/> Insulation R-value on plans <input type="checkbox"/> Shading or wall reflectance shown (if exception is applied)
Door - swinging	U-0.61	C402.1	Most hollow or filled-core opaque metal or wood doors comply.	
Door – non-swinging	R-4.75	C402.1	Insulated door required for roll-up and sliding applications.	<input type="checkbox"/> Insulated door shown on plans <input type="checkbox"/> Door R-value on plans or specs
Low-slope roof membrane	Aged reflectance ≥ 0.55 + aged emittance ≥ 0.75, or aged reflectance ≥ 0.64 (exceptions available)	C402.3	For roofs less than 2-in-12 slope and directly above conditioned space. Exceptions such as shaded roofs and portions covered by PV.	<input type="checkbox"/> Aged reflectance and emittance shown in plans or specs
Windows – maximum area	$\leq 30\%$ of gross wall area ($\leq 40\%$ when meeting daylighting requirements)	C402.4.1	Daylighting requirements for 40%: <ul style="list-style-type: none"> ▪ $\geq 50\%$ daylighted floor area (≤ 2 stories) or $\geq 25\%$ daylighted floor area (> 2 stories) ▪ Daylight responsive lighting controls ▪ Glazing visible transmittance $\geq 1.1 * SHGC$ If the project cannot comply with the prescriptive limit on window area, then it must comply with Section C407 Total Building Performance.	<input type="checkbox"/> $\leq 30\%$ window area Or <input type="checkbox"/> $\leq 40\%$ window area, and <input type="checkbox"/> meets daylighting requirements
Windows – solar heat gain coefficient (SHGC)	≤ 0.25 if projection factor < 0.2 . ≤ 0.30 if projection factor $0.2-0.5$. ≤ 0.40 if projection factor ≥ 0.5 . (Area-weighted average permitted)	C402.4.3	Projection factor = horizontal projection of overhang \div vertical distance from overhang to bottom of window. Area-weighted average SHGC allowed (by Hawaii amendment).	<input type="checkbox"/> SHGC indicated on plans <input type="checkbox"/> Overhang dimensions on plans, if applicable
Windows – U-factor	≤ 0.50 fixed fenestration ≤ 0.65 operable fenestration ≤ 1.10 entrance doors (Area-weighted average permitted)	C402.4.3	U-factor must include glazing and frame, not just center-of-glass. Typically requires dual-pane, low-e glazing. Metal frame ok. Entrance doors can be single-pane.	<input type="checkbox"/> U-factor indicated on plans
Skylights – minimum area	Skylights and daylight responsive controls required for certain spaces $\geq 2,500$ ft ² with ceiling height ≥ 15 ft.	C402.4.2	Required for following space types: office, lobby, atrium, concourse, corridor, storage space, gymnasium/exercise center, convention center, automotive service area, space where manufacturing occurs, nonrefrigerated warehouse, retail store, distribution/sorting area, transportation depot or workshop. Several exceptions, including when lighting power < 0.5 W/sf.	<input type="checkbox"/> Adequate skylight area shown on plans (if applicable) <input type="checkbox"/> Daylight responsive lighting controls shown on plans (if applicable)

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Skylights – maximum area	≤ 3% of gross roof area (≤ 5% when meeting daylighting requirements)	C402.4.1.2	Up to 5% allowed when space under the skylight has daylight-responsive controls. If the project cannot comply with the prescriptive limit on skylight area, then it must comply with Section C407 Total Building Performance.	
Skylights – solar heat gain coefficient (SHGC)	≤ 0.35 (≤ 0.60 with daylighting control)	C402.4.3	Area-weighted average SHGC allowed (by Hawaii amendment). Higher SHGC allowed if space has daylight-responsive lighting control.	<input type="checkbox"/> SHGC indicated on plans
Skylights – U-factor	≤ 0.75 (≤ 0.90 with daylighting control)	C402.4.3	Higher U-factor allowed if space has daylight-responsive lighting control.	<input type="checkbox"/> U-factor indicated on plans
Air leakage	<ul style="list-style-type: none"> ▪ Continuous air barrier ▪ Fenestration air leakage ▪ Openings to shafts, chutes, stairways and elevator lobbies ▪ Air intakes, exhaust openings, stairways, and shafts. ▪ Loading-dock weatherseals ▪ Recessed lighting 	C402.5	<ul style="list-style-type: none"> ▪ Code includes a list of acceptable air barrier materials. ▪ Max. fenestration leakage rates in Table C402.5.2. ▪ Openings to shafts, chutes, stairways and elevator lobbies are gasketed, weather-stripped or sealed. ▪ Air intakes, exhaust openings, stairways, and shafts have dampers. ▪ Loading-dock doors have weatherseals. ▪ Recessed lighting is IC rated and sealed. 	

* Code section added or modified by Hawaii amendment

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments

MECHANICAL REQUIREMENTS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
MECHANICAL SYSTEM REQUIREMENTS				
Certification	Responsible design professional certification on plans	C103.1*		<input type="checkbox"/> Signed statement on plans
Information on construction documents	Include: <ul style="list-style-type: none"> ▪ System design criteria ▪ Equipment type, capacity and efficiency ▪ System controls ▪ Fan motor hp and controls ▪ Duct sealing ▪ Duct and pipe insulation and location 	C103.2		
Mechanical system commissioning	For buildings with $\geq 480\text{kBtu/hr}$ cooling capacity: <ul style="list-style-type: none"> ▪ Include construction document notes indicating commissioning requirements ▪ Provide evidence of commissioning prior to final inspection. 	C408.2	Likely to apply to air-conditioned buildings of about 20,000 sf or larger. Plans may refer to specifications for detailed commissioning requirements. Requires a commissioning plan.	<input type="checkbox"/> Notes on plans indicate commissioning requirements
HVAC equipment performance	Tables C403.2.3(1) - C403.2.3(9)	C403.2.3	Cooling efficiency rated by SEER, EER, or kW/ton. Requirement varies by equipment type and cooling capacity.	<input type="checkbox"/> Cooling efficiency listed on plans <input type="checkbox"/> Cooling capacity listed on plans
HVAC system controls	<ul style="list-style-type: none"> ▪ Thermostatic controls ▪ Off-hour controls ▪ Door switches for guest-rooms* ▪ Shutoff dampers ▪ Zone isolation 	C403.2.4	Automatic off-hour thermostat control required. Door switches for guest rooms required.	<input type="checkbox"/> Appropriate controls indicated on plans

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Ventilation	<ul style="list-style-type: none"> ▪ Outdoor air ventilation per IMC ▪ Demand controlled ventilation ▪ Parking garage ventilation control 	C403.2.6	<ul style="list-style-type: none"> ▪ Natural or mechanical ventilation required for all spaces. ▪ Demand control ventilation required in certain cases for densely occupied spaces, to reduce ventilation when spaces are not fully occupied. ▪ Automatic fan control required for enclosed parking garages in many cases. 	<input type="checkbox"/> Outdoor air ventilation rates listed on plans <input type="checkbox"/> Controls and heat recovery provided (if applicable)
Energy recovery	Energy recovery effectiveness \geq 50%	C403.2.7	<ul style="list-style-type: none"> ▪ Energy recovery required in many cases, depending on supply air flow, ventilation rate and operating hours (Table C403.2.7) 	<input type="checkbox"/> Energy recovery device specs on plans
Kitchen exhaust	<ul style="list-style-type: none"> ▪ Limit on direct makeup air in hood. ▪ For flow > 5,000 cfm <ul style="list-style-type: none"> ○ Limit on cfm/ft ○ Additional requirements 	C403.2.8	<ul style="list-style-type: none"> ▪ Kitchen exhaust systems allowed \leq10% replacement air directly into hood. ▪ For kitchens > 5,000 cfm exhaust, one of the following is required: 1) transfer air \geq50%, 2) demand-control ventilation, or 3) energy recovery 	<input type="checkbox"/> Kitchen hood and exhaust fan specs on plans
Duct and plenum insulation	\geq R-6 in unconditioned space \geq R-8 outdoors	C403.2.9		<input type="checkbox"/> Duct insulation R-value on plans
Duct and plenum sealing	Sealed per IMC	C403.2.9		
Piping insulation	Minimum thickness per table C403.2.10	C403.2.10		<input type="checkbox"/> Pipe insulation thickness on plans
HVAC fans	When fan motors' total hp \geq 5hp <ul style="list-style-type: none"> ▪ Allowable fan horsepower ▪ Motor nameplate horsepower ▪ Fan efficiency 	C403.2.12	Requires the designer to calculate allowed fan horsepower as a function of airflow.	<input type="checkbox"/> Hp or bhp for all supply, return, exhaust, and terminal-unit fans on plans. <input type="checkbox"/> Airflow for all fans on plans.
Refrigeration systems	<ul style="list-style-type: none"> ▪ Refrigeration equipment performance ▪ Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and freezers ▪ Refrigerated display cases ▪ Condenser requirements ▪ Compressor requirements 	C403.2.14, C403.2.15, C403.2.16, C403.5	See code for specific requirements for commercial refrigeration systems.	<input type="checkbox"/> Refrigeration equipment kWh/day rating on plans
Multiple-zone system fan control	<ul style="list-style-type: none"> ▪ Two-stage or variable airflow control ▪ Static pressure sensor location ▪ Static pressure reset control 	C403.4.1	At least 2-stage fan control required for DX cooling \geq 65kBtu/hr and chilled water systems \geq 1/4 hp fan.	<input type="checkbox"/> Fan control on plans (if applicable)

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Hydronic system controls	<ul style="list-style-type: none"> ▪ Part-load controls for systems ≥ 500 kBtu/hr ▪ Pump isolation with multiple chillers or boilers 	C403.4.2	Variable-flow CHW loops and heat-rejection loops for water-cooled air conditioners are required if ≥ 500 kBtu/hr capacity, ≥ 10 hp combined pump power, and ≥ 3 control valves. Variable-speed pumps or staged pumps required.	<input type="checkbox"/> Pump control on plans (if applicable)
Heat rejection equipment fan speed control	<ul style="list-style-type: none"> ▪ Speed control for cooling tower fans ≥ 7.5 hp ▪ Multiple-cell cooling tower fan control ▪ Limitation on centrifugal fan open-circuit cooling towers ▪ Tower flow turndown 	C403.4.3	Cooling tower fans ≥ 7.5 hp required to have multi-speed or variable-speed control.	<input type="checkbox"/> Cooling tower fan motor hp on plans <input type="checkbox"/> Fan control on plans (if applicable)
Multiple-zone systems	<ul style="list-style-type: none"> ▪ Variable air flow ▪ ECM motors for 1/12 hp - 1 hp ▪ Supply air temperature reset control ▪ Ventilation optimization control 	C403.4.4	In variable air volume (VAV) systems, reheat is not permitted except when airflow is reduced to a minimum level specified in the code. Fan motors in fan-powered VAV boxes must be electronically commutated motors.	<input type="checkbox"/> VAV box max. and min. airflow shown on plans (if applicable)
Heat recovery for service water heating	Condenser heat recovery for systems operating 24 hr/day with water-cooled cooling capacity $\geq 6,000$ kBtu/hr and service water heating load $\geq 1,000$ kBtu/hr	C403.4.5	Most typically applies to hotels, high-rise residential buildings, and hospitals.	
Hot gas bypass	Not allowed except under specific conditions	C403.4.6		

* Code section added or modified by Hawaii amendment

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments

WATER HEATING REQUIREMENTS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
SERVICE WATER HEATING REQUIREMENTS				
Certification	Responsible design professional certification on plans	C103.1*		<input type="checkbox"/> Signed statement on plans
Information on construction documents	Include <ul style="list-style-type: none"> ▪ Water heating equipment type, size and efficiency ▪ System controls ▪ Pipe insulation and location 	C103.2		
System commissioning	For buildings with ≥ 600 kBtu/hr combined space heating and service water heating capacity: <ul style="list-style-type: none"> ▪ Include construction document notes indicating commissioning requirements ▪ Provide evidence of commissioning prior to final inspection. 	C408.2	Likely to apply to buildings with significant hot water demand such as high-rise residential, hotels, and hospitals. Plans may refer to specifications for detailed commissioning requirements. Requires a commissioning plan.	<input type="checkbox"/> Notes on plans indicate commissioning requirements
Service water-heating equipment efficiency	Efficiency per Table C404.2	C404.2	Table covers electric resistance, heat pump, storage gas, instantaneous gas, and pool heaters.	<input type="checkbox"/> Equipment capacity and efficiency listed on plans
Heat traps	For non-circulating systems provide equipment with integral heat traps or provide heat traps on supply and discharge piping.	C404.3	Intent is to prevent thermosiphoning in non-circulating systems. Heat trap may be integral to the water heater. May be a 180 degree bend in inlet and outlet pipe.	<input type="checkbox"/> Heat trap(s) indicated on plans (if applicable)
Pipe insulation	Insulation thickness per Table C403.2.10: <ul style="list-style-type: none"> ▪ 1" for pipes $< 1\frac{1}{2}$" diameter ▪ $1\frac{1}{2}$" for pipes $\geq 1\frac{1}{2}$" diameter Circulating systems: all supply pipe. Non-circulating storage systems: first 8 ft from tank (or from tank to heat trap) on inlet and outlet.	C404.4		<input type="checkbox"/> Insulation location and thickness indicated on plans

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Maximum supply pipe length/volume	Table C404.5.1 lists maximum hot water supply pipe length or volume, which varies with pipe diameter.	C404.5	Allowed length for pipes to public lavatories is much shorter than for other fixtures, ranging from 6' for 1/4" pipe to only 0.5' for 3/4" or larger pipe.	<input type="checkbox"/> Maximum hot water pipe length indicated on plans
Circulation system controls	Automatic controls to start pump based on demand and to automatically shut off pump based on temperature and on lack of demand	C404.6.1	Automatic control turns on circulation pump based on demand, such as with a flow sensor. Automatic controls turn off circulation pump when water in the loop is at the desired temperature. Controls must be accessible.	<input type="checkbox"/> Automatic circulation controls indicated on plans
Pool and spas	Readily accessible on/off switch No continuous pilot light Time switch for heater and pumps Pool covers required, except with >70% site-recovered heat	C404.9		<input type="checkbox"/> Readily accessible pool heater on/off switch <input type="checkbox"/> Time switch on heater and pump <input type="checkbox"/> Pool cover or <input type="checkbox"/> site-recovered heat

* Code section added or modified by Hawaii amendment

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments

LIGHTING & ELECTRICAL REQUIREMENTS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
LIGHTING AND ELECTRICAL REQUIREMENTS				
Certification	Responsible design professional certification on plans	C103.1*		<input type="checkbox"/> Signed statement on plans
Information on construction documents	Include <ul style="list-style-type: none"> ▪ Lighting fixture schedule with input power ▪ Lighting control narrative ▪ Location of daylight zones on floor plans 	C103.2		
Lighting system functional testing	Prior to final inspection the registered design professional provides evidence of testing. <ul style="list-style-type: none"> ▪ Occupant sensor controls ▪ Time-switch controls ▪ Daylight responsive controls Construction documents specify that certification documents be provided to the owner within 90 days of certificate of occupancy.	C408.3	Intent is that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's instructions	<input type="checkbox"/> Plans indicate that functional test certification documents will be provided to owner <input type="checkbox"/> Registered design professional provides evidence of testing
Dwelling unit lighting	Lighting equipment $\geq 75\%$ high efficacy lamps	R404.1	High efficacy lamps are defined as: <ul style="list-style-type: none"> ▪ T-8 or smaller diameter fluorescent ▪ Compact fluorescent ▪ 60 lumens/watt if $>40W$ ▪ 50 lumens/watt if $>15W$ and $\leq 40W$ ▪ 40 lumens/watt if $\leq 15W$ Applies to permanently-installed fixtures. Low-voltage lighting is exempt.	<input type="checkbox"/> Lighting fixture locations on plans <input type="checkbox"/> Lighting fixture schedule includes input power and lumen output <input type="checkbox"/> Plans show $\geq 75\%$ high efficacy lamps

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Controls - occupant sensor	Required in many specific spaces. Manual-on type required in most cases.	C405.2.1	Required in these space types: 1. Classrooms/lecture/training rooms. 2. Conference/meeting/multipurpose rooms. 3. Copy/print rooms. 4. Lounges. 5. Employee lunch and break rooms. 6. Private offices. 7. Restrooms. 8. Storage rooms. 9. Janitorial closets. 10. Locker rooms. 11. Other spaces 300 sf or less that are enclosed by floor-to-ceiling height partitions. 12. Warehouses.	<input type="checkbox"/> Occupant sensor controls on plans, where applicable
Controls - time-switch	Required where occupant sensors are not used. Specific spaces allowed to use light-reduction controls as an alternative.	C405.2.2	Time switch controls not required in the following spaces if manual light-reduction controls are used: 1. Sleeping units. 2. Spaces where patient care is directly provided. 3. Spaces where an automatic shutoff would endanger occupant safety or security. 4. Lighting intended for continuous operation. 5. Shop and laboratory classrooms.	<input type="checkbox"/> Time switch controls on plans, where applicable
Controls – light reduction	Required where occupant sensors are not used. Requires manual control to allow occupant to reduce lighting power by at least 50%	C405.2.2.2	Requires reasonably uniform illumination at the reduced light level. Not required for daylighted zones that meet the control requirements in C405.2.3	<input type="checkbox"/> Circuiting or controls on plans indicate multi-level control
Controls - daylight-responsive	Required in spaces with $\geq 150W$ of lighting within daylight zones. Some exceptions, such as patient care areas and dwelling units. Definitions provided for sidelight and toplight daylight zones.	C405.2.3	Sidelight daylight zone is the floor area adjacent to windows with a depth equal to the window head height and width equal to two feet to either side of the window. Toplight daylight zone is the floor area under a skylight extending to 0.7 times the ceiling height on all sides of the skylight. (See the code for further details and exceptions)	<input type="checkbox"/> Automatic daylight responsive lighting controls indicated, where applicable
Controls – display & accent lighting	Display lighting, accent lighting and display-case lighting controlled separately from general lighting.	C405.2.4		<input type="checkbox"/> Controls indicated on plans

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Controls – guest rooms	Hotel, motel, and timeshare sleeping units and guest suites have master control to automatically switch off luminaires and switched receptacles within 20 minutes after all occupants leave the room	C405.2.4*	Typically key-card or motion-sensor based controls. Hawaii amendment adds timeshare sleeping units.	<input type="checkbox"/> Controls indicated on plans
Exit signs	≤ 5 watts per face	C405.3		<input type="checkbox"/> Indicated in fixture schedule
Total connected interior lighting power	Includes input power for all proposed luminaires. Some exceptions apply. Special cases: <ul style="list-style-type: none"> ▪ Screw-in luminaires. Rated luminaire power (not the lamp power) ▪ Low-voltage lighting. Power rating of the transformer (not the lamp power) ▪ Line-voltage track lighting. Input power for the proposed luminaire power (but not less than 30 W/linear foot) or the power of the circuit breaker or other current-limiting device. 	C405.4.1	Note that luminaire input power is not necessarily equal to the rated watts of the lamps. Input power for fluorescent and HID fixtures depends on the lamp/ballast combination. The input power for the specified fixtures must be listed in the fixture schedule on the plans. Pay special attention to the special cases such as screw-base fixtures as noted to the left.	<input type="checkbox"/> All fixtures located and identified on plans <input type="checkbox"/> Fixture schedule includes input power for each fixture
Interior lighting power allowance	Total connected power shall be no greater than allowance. Two calculation methods for allowance: <ul style="list-style-type: none"> ▪ Building area method ▪ Space-by-space method (includes extra allowance for retail and decorative lighting) 	C405.4.2	Though not required by code, ideally the designer includes a table on the plans showing the allowed lighting power calculation (listing space types and floor areas) along with a total of the connected lighting power.	
Exterior lighting controls	Photo cell and time-based control required. <ul style="list-style-type: none"> ▪ For façade and landscape lighting, automatic on/off off-hour required. ▪ Otherwise, automatic reduction ≥30% required during off-hours. ▪ Some exceptions apply. 	C405.2.5	Automatically turn off lights as a function of daylight. In addition: <ul style="list-style-type: none"> ▪ Façade and landscape lighting controlled to a set opening and closing time ▪ For all others controls automatically reduce lighting power by ≥30% from midnight to 6am (or longer). 	<input type="checkbox"/> Controls indicated on plans

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Exterior building lighting power	Maximum allowed power listed in Table C405.5.2(2) includes: <ul style="list-style-type: none"> ▪ Base allowance ▪ Tradeable allowance ▪ Non-tradeable allowance Allowances vary by lighting zone per Table C405.5.2(1)	C405.5	Though not required by code, ideally the designer includes a table on the plans showing the allowed lighting power calculation for both tradeable and non-tradeable exterior lighting areas along with a total of the connected exterior lighting power.	<input type="checkbox"/> All fixtures located and identified on plans <input type="checkbox"/> Fixture schedule includes input power for each fixture
Electricity meters	Each dwelling unit in R-2 building has a separate electric meter.	C405.6		<input type="checkbox"/> Meters indicated on plans
Electrical transformers	Electric transformers meet efficiency requirements of Table C405.7. Some exceptions apply.	C405.7	See code for list of exempted types of transformers.	<input type="checkbox"/> Transformer efficiency indicated on plans
Electrical motors	Electric motors meet the efficiency requirements of Tables C405.8(1)-(4)	C405.8		<input type="checkbox"/> Electric motor efficiency indicated on plans
Vertical and horizontal transportation systems	<ul style="list-style-type: none"> ▪ Elevator cab lighting ≥ 35 lumens/watt. ▪ Elevator cab fan ≤ 0.33 W/cfm. ▪ Escalator and moving walkway automatic speed control. ▪ Escalator regenerative drive. 	C405.9	Elevator cab lighting will need to be fluorescent or LED.	
Electrical sub-metering	In new buildings with tenants, metering shall be collected for the entire building and individually for each tenant occupying $\geq 1,000$ ft ² (total enclosed and unenclosed). Tenants shall have access to data collected for their space.	C405.10*	Hawaii amendment.	<input type="checkbox"/> Meters indicated on plans

* Code section added or modified by Hawaii amendment

COMMERCIAL CHECKLIST
 IECC 2015 with State Amendments
ADDITIONAL EFFICIENCY REQUIREMENTS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
ADDITIONAL EFFICIENCY REQUIREMENTS				
Requirements	Project must meet at least one of the following requirements.	C406.1	This is a new requirement. New construction projects must meet at least one of these additional efficiency requirements.	
More efficient HVAC equipment	<ul style="list-style-type: none"> 10% better than minimum efficiency 	C406.2	<p>Requires cooling efficiency at least 10% better than code.</p> <p>In the case of EER, a higher value is better. For example, if the Table C403.2.3 requirement is 10.0 EER, then the project would need ≥ 11.0 EER.</p> <p>For water cooled chillers the requirement is in kW/ton and lower is better. If the requirement is 0.660 kW/ton, then the proposed chiller must be ≤ 0.594 kW/ton.</p>	
Reduced lighting power density	<ul style="list-style-type: none"> 10% lower allowed lighting power 	C406.3	The connected interior lighting power for the proposed design must be at least 10% lower than the allowed interior lighting power.	
Enhanced digital lighting controls	<ul style="list-style-type: none"> Continuous dimming and digitally-addressable luminaires 	C406.4	<p>In this type of lighting control system each luminaire, or small group of luminaires, is connected via a digital network. Luminaires can be dimmed and turned on/off individually or in small groups based on signals from networked sensors.</p> <p>Sequence of operations must be included in the construction documents.</p>	

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
On-site renewable energy	<ul style="list-style-type: none"> ▪ ≥ 0.5 W/ft², or $\geq 3\%$ of mechanical, water heating and lighting energy. 	C406.5	<p>Two options. An on-site renewable energy system provides:</p> <ol style="list-style-type: none"> 1. ≥ 0.50 watts per sf of conditioned floor area. 2. $\geq 3\%$ of the energy required for HVAC, water heating and lighting. <p>Very roughly, the area of PV panels required to meet #1 would be 1 sf per every 20-30 sf of conditioned floor area.</p>	
Dedicated outdoor air system	<ul style="list-style-type: none"> ▪ For multiple-zone systems, include independent system with total heat recovery to condition ventilation air. 	C406.6	<p>To meet this requirement, a separate system provides 100% conditioned outdoor air to each space. Energy recovery from exhaust air is also required.</p> <p>An example of a typical system is fan-coils serving individual zones, with conditioned outdoor air delivered from a central air handler to each fan coil. Exhaust air is ducted back to the air handler for energy recovery.</p>	
Reduced energy in service water heating system	<ul style="list-style-type: none"> ▪ For specific building types, $\geq 60\%$ solar or waste heat recovery for water heating. 	C406.7	<p>Applies to the following building types:</p> <ol style="list-style-type: none"> 1. Group R-1: Boarding houses, hotels or motels. 2. Group I-2: Hospitals, psychiatric hospitals and nursing homes. 3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas. 4. Group F: Laundries. 5. Group R-2: Buildings with residential occupancies. 6. Group A-3: Health clubs and spas. 7. Buildings showing a service hot water load of 10 percent or more of total building energy loads. 	

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments

REQUIREMENTS FOR ADDITIONS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
ADDITIONS				
General	Requirements for new construction apply to additions. Unaltered portions of the existing building are not required to comply.	C502.1	There are two general compliance options: 1. The addition alone 2. The addition + existing building as one building	
Windows – maximum area	<ul style="list-style-type: none"> ▪ Total building window area including addition \leq 30% of gross wall area ▪ Or, window area in addition alone \leq 30% of gross added wall area (\leq 40% when meeting daylighting requirements) 	C502.2.1	If the project cannot comply with the prescriptive limit on window area, then it must comply with Section C407 Total Building Performance.	
Window – U-factor and SHGC	Same as new construction. See envelope checklist	C502.2.1	Requirements do not apply when glass is replaced in an existing sash (C504.2).	
Skylights – maximum area	<ul style="list-style-type: none"> ▪ Total building skylight area including addition \leq 3% of gross roof area ▪ Or, skylight area in addition alone \leq 3% of gross roof area (\leq 5% when meeting daylighting requirements) 	C502.2.2	If the project cannot comply with the prescriptive limit on skylight area, then it must comply with Section C407 Total Building Performance.	
Skylight – U-factor and SHGC	Same as new construction. See envelope checklist	C502.2.2		
Mechanical systems	Requirements for new systems and equipment serving additions are the same as for new construction. See the mechanical checklist.	C502.2.3	Unaltered portions are not required to comply.	

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Service water heating	Requirements for new equipment, controls and piping serving additions are the same as for new construction. See the service water heating checklist.	C502.2.4	Unaltered portions are not required to comply.	
Pools and spas	Requirements for new pools and in-ground spas are the same as for new construction. See the service water heating checklist.	C502.2.5		
Interior lighting	Requirements for lighting systems in additions are the same as for new construction. See the lighting checklist. Interior lighting power options: <ul style="list-style-type: none"> ▪ Addition alone complies ▪ Addition + existing building complies 	C502.2.6 C502.2.6.1	Requirements do not apply when bulbs and/or ballasts are replaced within existing luminaires (C504.2)	
Exterior lighting	Requirements for exterior lighting systems for additions are the same as for new construction. See the lighting checklist. Exterior lighting power options: <ul style="list-style-type: none"> ▪ Addition alone complies ▪ Addition + existing building complies 	C502.2.6 C502.2.6.1	Requirements do not apply when bulbs and/or ballasts are replaced within existing luminaires (C504.2)	

COMMERCIAL CHECKLIST

IECC 2015 with State Amendments

REQUIREMENTS FOR ALTERATIONS



Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
ALTERATIONS				
General	New-construction requirements apply to altered portions of the building. Unaltered portions are not required to comply.	C503.1		
Change in space conditioning	Full compliance is required for previously unconditioned spaces that are altered to become conditioned	C503.2		
Roof	<p>No requirement:</p> <ul style="list-style-type: none"> ▪ Roof recover ▪ Ceiling/roof cavity not exposed <p>New-construction requirements:</p> <ul style="list-style-type: none"> ▪ New roof ▪ Roof replacement ▪ Alteration where ceiling/roof cavity is exposed (exception if cavity is filled with insulation) 	C503.1 C503.3.1*	<ul style="list-style-type: none"> • Any new roof must meet the requirements for a new roof. • Roof replacement where the roof is part of the thermal envelope and insulation is above deck must be brought up to compliance with the insulation requirements. • Roof alterations that expose the ceiling or roof cavity where that cavity is part of the thermal envelope shall meet the R-value requirement for new roofs, except a lower R-value is allowed if the cavity is filled with insulation. 	
Wall	<p>No requirement:</p> <ul style="list-style-type: none"> ▪ Wall cavity is not exposed <p>New-construction requirements:</p> <ul style="list-style-type: none"> ▪ Wall cavity is exposed (exception if cavity is filled with insulation) 	C503.1	If a wall cavity is exposed during alteration, then it shall be insulated to meet the new-construction requirement. However, it is acceptable to install a lower R-value if the cavity is filled (i.e. not deep enough to meet the code requirement).	

Component/System	Requirement	Code Section	Plan Review Notes	Info on Plans
Windows – maximum area	<ul style="list-style-type: none"> ▪ Total building window area after added windows ≤ 30% of gross wall area ▪ Or, window area in space with added windows alone ≤ 30% of gross wall area (≤ 40% when meeting daylighting requirements) 	C503.3.2	If the project cannot comply with the prescriptive limit on window area when new windows are added, then it must comply with Section C407 Total Building Performance.	
Window – U-factor and SHGC	Same as new construction. See envelope checklist	C503.3.2 C401.2.1	Requirements do not apply when glass is replaced in an existing sash (C504.2).	
Skylights – maximum area	<ul style="list-style-type: none"> ▪ Total building skylight area after added skylights ≤ 3% of gross roof area ▪ Or, skylight area in space with added skylight(s) alone ≤ 3% of gross roof area (≤ 5% when meeting daylighting requirements) 	C503.3.3	If the project cannot comply with the prescriptive limit on skylight area when new skylights are added, then it must comply with Section C407 Total Building Performance.	
Skylight – U-factor and SHGC	Same as new construction. See envelope checklist	C503.3.3		
Mechanical systems	New heating, cooling and duct systems are required to meet new construction requirements.	C503.4	For example, replacement air conditioners must meet the efficiency requirements, and new ducts must meet the insulation requirements. Unaltered portions of the system are not required to comply.	
Service water heating systems	New water heating systems are required to meet new construction requirements.	C503.5	Unaltered portions of the system are not required to comply.	
Lighting systems	<p>New lighting systems that are part of an alteration are required to meet new construction requirements.</p> <ul style="list-style-type: none"> ▪ Exception if less than 10% of luminaires in a space are replaced and installed lighting power does not increase 		Requirements do not apply when bulbs and/or ballasts are replaced within existing luminaires (C504.2)	

* Code section added or modified by Hawaii amendment