

## SIGNIFICANT CHANGES BETWEEN THE 2006 AND 2009 INTERNATIONAL ENERGY CONSERVATION CODE

The table provides a comparison of the major differences between the residential provisions of the 2006 and 2009 International Energy Conservation Code (IECC).

Topic <i>Chapter 1</i>	2006 IECC	2009 IECC
Additions, alterations and repairs	Section 101.4.3 Exempts certain alterations to the building envelope from alteration requirements including exposing existing wall, roof and floor systems that are already insulated, glass replacements only in existing sash and frame and installing storm windows	Includes several exceptions for alterations including the following: <ul style="list-style-type: none"> <li>• If a vestibule is part of the door assembly that is modified, it must remain on the building or be replaced</li> <li>• Up to 50% of the luminaries can be replaced as long as the load is not increased in the building.</li> <li>• Bulb, ballast replacements are exempt providing the alteration does not increase the load.</li> </ul>
Change in Occupancy	Section 101.4.4 Requires that energy using features that are increased due to a change in occupancy to comply with the IECC.	Requires lighting to comply with the IECC if the building spaces change from one occupancy in Table 505.5.2 to another occupancy in Table 505.5.2.
Change in Space Conditioning	None	Requires a space that was previously unconditioned to be brought into full compliance if the space is conditioned.
Alternate Materials – Method of Construction, Design or Insulating Systems	Section 103.1 Above Code Programs – Added provision that allows the building official to accept compliance with an above code programs as a deem to comply method to comply with the 2006 IECC.	Requires that the above code programs also comply with the mandatory requirements specified in Chapter 4 and 5 of the IECC.

Topic	2006 IECC	2009 IECC
Construction Documents	Section 104 Requires that features that were used to demonstrate compliance with the IECC to be identified on the plans, specification or documentation.	Increases the scope of Section 104 to include provisions that focus on previous approvals, phased approvals, amendments to construction documents and also retention of construction documents.
Inspections	Section 105 Requires that no work shall be covered before approval. Also requires a final inspection	Adds additional language that allows the use of inspection agencies and specifies that the holder of the permit is responsible for notifying the building official for an inspection request. Also allows the inspector to revoke a notice of approval of the notice is issued in error or due to incorrect information.
Fees	None	Section 108 Provides guidance for when a permit can be issued based on the payment of fees.
Stop Work Order	None	Section 109 Provides authorization for the code official to stop work.
Board of Appeals	None	Section 110 Allows for the creation of a Board of Appeals.
<b>Chapter 2 Definitions</b>		
Definitions (added the following definitions):		
Air Barrier	None	Section 202 Defines an air barrier as a barrier to air leakage through the building envelope.
C-Factor (Thermal Conductance)	None	Section 202 Defines the coefficient of heat transfer

Topic	2006 IECC	2009 IECC
C-Factor (Thermal Conductance) (Con't)		through a building assembly in Btu/Hr-ft <sup>2</sup> -°F
Daylight Zone	None	Section 202 Defines a daylight zone for vertical glazing and under a skylight in a commercial building.
Demand Control Ventilation	None	Section 202 Provides a definition for a control that provides for the automatic reduction in mechanical ventilation due to actual occupant load of the space.
Fan Brake Horsepower	None	Section 202 Defines how brake horsepower is determined for use in meeting the requirements in Chapter 5.
Fan System Design Conditions	None	Section 202 Operating conditions that can be expected to occur during normal system operation that result in the highest supply fan air flow rate to conditional spaces served by the system.
Fan System BHP		Section 202 The sum of the break horsepower for all of the fan systems used to supply heated or cooled air to a space and to return the air.
Fan System Nameplate HP	None	Section 202 The sum of all of the motor nameplate horsepower for all of the fans that are required to provide and return heat and cool to a space.
High-Efficiency Lamps	None	Section 202 Provides a definition of lamps that will meet the minimum lumen/watt requirements that are set for Chapter 4.

Topic	2006 IECC	2009 IECC
Nameplate Horsepower	None	Section 202 The nominal motor horsepower stamped on the motor nameplate.
Vapor Retarder	Section 202 Moved vapor retarder criteria from residential provisions to Chapter 2 Definitions	Redefines vapor retarders based on the perm rating of the material.
<b>Chapter 4</b>		
Compliance by Prescriptive Specification	Section 402.1 Provides one table for building with unlimited glazing area. Comparison of requirements contained in separate table.	Reduced the Glazing U-factor: <ul style="list-style-type: none"> <li>• U-0.65 Climate Zone 2</li> <li>• U-0.50 Climate Zone 3</li> <li>• U-0.35 Climate Zone 4</li> </ul> Reduced the Glazing SHGC: <ul style="list-style-type: none"> <li>• SHGC-0.30 Climate Zone 1</li> <li>• SHGC-0.30 Climate Zone 2</li> <li>• SHGC-0.30 Climate Zone 3</li> </ul> Increased Exterior Wall R-value <ul style="list-style-type: none"> <li>• R-20 or R-13+R-5 Climate Zone 5 and 6</li> </ul>
Compliance by Prescriptive Specification (con't)		Increased Floor R-value: <ul style="list-style-type: none"> <li>• R-38 Climate Zone 8</li> </ul> Increase Basement Wall R-value: <ul style="list-style-type: none"> <li>• R-5/13 Climate Zone 3</li> <li>• R-15/19 Climate Zone 6</li> </ul> R-15/19 Climate Zone 7 and 8
Compliance by total building envelope performance	Section 402.1.4 Total UA Alternative provided (basis for REScheck software)	Modified values in Table 402.1.3 to reflect R-value changes to Table 402.1.1
Truss/rafter construction	Section 402.2.1 Allows reduced insulation (down to R-30) levels in rafter systems up to 500 ft <sup>2</sup> when insulation cannot fit into the rafter space.	Reduces area of reduced insulation in rafter systems to either 500 ft <sup>2</sup> or 20% of the total insulated ceiling area, whichever is less.

Topic	2006 IECC	2009 IECC
Access hatches and doors	None	Section 402.2.3 Requires attic access hatches and doors from conditioned space to unconditioned space to be weatherstripped and insulated to the level equivalent to the assembly where it is located.
Steel frame ceilings, walls and floors	Section 402.2.4 Same	Allows R-3 continuous insulation to be installed on steel-framed wall systems in Climate Zone 1 and 2 if the stud spacing is 24" on center.
Opaque door exemption	Section 402.3.4 Exempts up to one opaque door from the Prescriptive U-factor requirements	Limits the door opaque door exemption to a side swinging door not more than 24 ft <sup>2</sup> .
Moisture Control	Section 402.5 Exempts climate zones 1 – 4 from the vapor retarder requirement.	Defines a vapor retarder based on Class (Type 1-3) and allows for the use of latex paint as a vapor retarder based on siding type and Climate Zone.
Air leakage	Section 402.4.1 Contains similar requirements but identifies specific places where air sealing must occur.	Adds attic access openings and rim joists to the list of spaces to air seal. Also includes a checklist that must be followed with an option to perform a blower door test. Requires fireplaces to have tight fitting doors and use outdoor combustion air.
Programmable Thermostats	None	Section 403.1.1 Requires programmable thermostats when the primary heating system is a forced air system.
Piping Insulation	Section 403.3 Requires HVAC piping to be insulated to an R-2.	Increases the pipe insulation to an R-3
Duct Construction	Section 403.2.2	Requires all ducts to be sealed and also

<b>Topic</b>	Same as 2003 IECC but also requires air <b>2006 IECC</b>	requires ducts and air handler to either be <b>2009 IECC</b>
Duct Construction (Con't)	handler and filter boxes to be sealed.	located completely inside conditioned space or a duct tightness test performed on the system.
Systems serving multiple dwelling units	None	Section 403.7 Requires projects with mechanical systems with the ability to serve multiple dwelling units at the same time to meet the requirements of Section 504.
Snow melt system controls	None	Section 403.8 Requires snow melt controls on all snow melt equipment installed as part of a residential project.
Swimming pool	None	Requires pool covers on all heated pools and spas.
Simulated Performance Approach	Section 404 New base case requirements based on Table 402.1.1. RESNET modeling requirements for Energy Star buildings. Modeling assumptions based on	Modified the Standard Reference Design: <ul style="list-style-type: none"> <li>• The proposed glass to floor area where the proposed glass to floor area</li> <li>• is <math>\leq 15\%</math></li> <li>• 15% glass to floor area where the proposed glass to floor area is <math>\geq 15\%</math></li> <li>• Heating efficiency same as proposed design</li> <li>• Cooling efficiency same as proposed design</li> </ul> Water heating Energy Factor same as proposed design.
<b>Chapter 5</b>		
Design By Acceptable Practice for Commercial Buildings	Code requirements for commercial buildings contained in Chapter 5 due to the replacement of Chapters 4, 5 and 6 with	Requires that the code user must demonstrate compliance with Chapter 5, of the IECC in its entirety or ASHRAE 90.1-2007

	Chapter 4 and the elimination of Chapter 7 <b>2006 IECC</b>	but can not mix compliance approaches on <b>2009 IECC</b>
<b>Topic</b> Design By Acceptable Practice for Commercial Buildings (Con't)	from the IECC.	the same project. Added a comparable assembly U-factor table to correspond to the R-value requirements in Table 502.2(1).
<b>ASHRAE/IESNA Reference</b>	Section 501.1 References ASHRAE/IESNA 90.1-2004	References ASHRAE 90.1-2007
Window are to gross above grade wall area	Section 502.3.1 Allows buildings up to 40% of the window area to gross above grade wall area. Buildings that exceed this level are to use 90.1-2004 or Section 506.	Expands Table 502.2(1) to include a separate category for high-rise residential and commercial occupancies. Increases the insulation requirements for both highrise residential and commercial in several climate zones.
Moisture Control	Section 502.5 Requires vapor retarders to be installed in unvented framed cavities in Climate Zones greater that 3.	Defines a vapor retarder based on Class (Type 1-3) and allows for the use of latex paint as a vapor retarder based on siding type and Climate Zone.
Above Grade Walls	Section 502.2.3 Wall categories include: <ul style="list-style-type: none"> <li>• Mass</li> <li>• Metal building</li> <li>• Metal framed</li> <li>• Wood framed and other</li> </ul>	No Change
Metal Building walls	Table 502.2(2) Provides a description for meeting the metal building wall requirements	Adds additional descriptions for metal building walls
Roof assembly	Section 502.2.1 <ul style="list-style-type: none"> <li>• Roof categories include:</li> <li>• Insulation entirely above deck</li> <li>• Metal buildings (with R-5 thermal blocks)</li> <li>• Attic and other</li> </ul>	Adds additional assembly descriptions for metal roof systems

<b>Topic</b>	<b>2006 IECC</b>	<b>2009 IECC</b>
Roof assembly (Con't)	2006 IECC also prohibits counting insulation placed on a suspended ceiling and counting it toward compliance with the roof R-value requirement.	
Skylights	Section 502.3.1 Skylight U-factor based on Climate Zone and material (either glass or plastic). Maximum SHGC also required for skylights. Skylight percentage limited to 3% of gross roof area.	Consolidated the U-factor and SHGC requirements for skylights into one skylight category. Reduced (made more stringent) the U-factor and SHGC requirements.
HVAC equipment performance requirements	Section 803.2.3 Air Conditioners, Air Cooled < 65,000 Btu/h required SEER 13.0 for Split Systems	Allows for alternative for water-cooled centrifugal water-chilling package efficiency. Revises equipment efficiency tables for water-chilling packages.
Snow melt controls	None	Requires snow melt controls on all snow melt equipment installed as part of a commercial project.
Demand control ventilation	None	Requires demand control ventilation for spaces larger than 500ft <sup>2</sup> with an average occupant load of 40 people per 1000ft <sup>2</sup> .
Energy recovery ventilation	Section 503.2.6 Requires an energy recovery ventilation system for systems of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity. Several exceptions.	Removed the exception for laboratory fume hood systems with a total exhaust rate of 15,000 cfm or less.
Duct and plenum insulation and sealing	Section 503.2.7 Requires minimum duct insulation R-value of 5 for ducts in unconditioned space and R-8 outside the building. Requires approved sealing for low, medium or high pressure duct systems. Specifies UL 181 labeling for specific duct connections. Requires	References the 2009 International Mechanical Code for air sealing requirements.

<b>Topic</b>	<b>2006 IECC</b>	<b>2009 IECC</b>
Duct and plenum insulation and sealing (con't)	maximum duct leakage rate of 6.0 for high pressure duct systems	
HVAC Piping Insulation	Section 503.2.8 Requires piping used to convey "conditioned" fluids to be insulated. Includes some exceptions.	Adds an exception for factory-installed piping within room fan-coils and unit ventilators. Increase piping insulation thickness by ½" for piping ≤ 1.5".
Simple System Economizers	Section 503.3.1 Requires economizers for all cooling systems for systems ≥ 54,000 btu/h. No exceptions for economizers in Climate Zones 5b and 6b.	Requires systems greater than 54,000 btu/h in hot humid climates (Zone A) to meet the economizer requirements for Climate Zone 3 and above. Eliminates the category for systems ≥ 135,000 Btu/h and sets the threshold for requiring an economizer to 54,000 Btu/h for all systems.
Fan power limitations	None	Section 503.2.10 Requires HVAC fan systems greater than 5 hp to meet maximum fan power horsepower requirements.
Hydronic (water loop) heat pump systems.	503.4.3.3 Provides requirements for the use of heat injection and heat rejection into the heat pump loop. Places requirements for bypassing the cooling tower when it is not needed.	Reorganizes the code provision to make it more understandable. Splits the requirements for bypassing the cooling tower when no heat rejection is needed based on Climate Zone.
Supply air temperature reset controls	None	503.4.5.4 Requires controls to be placed systems serving multiple zones to be able to reset the supply air temperature by 25% based on the supply air temperature and the room temperature.
<b>Section 505 Electrical Power and Lighting</b>		

<b>Systems</b>		
<b>Topic</b>	<b>2006 IECC</b>	<b>2009 IECC</b>
Efficient lighting in dwelling units	None	Section 505.1 Requires at least 50% of the permanently connected lighting in dwelling units to be fitted with high efficacy lamps.
Daylight zone control	None	Section 505.2.2.3 Requires that connected lighting that is installed in daylight zones be separately switched from other lighting in the space. Daylight zones are defined for spaces with vertical fenestration and also for skylights.
Exterior Lighting Controls	<p>505.2.4 Places on the type of controls that can be used to control exterior lighting not intended for 24 hour operation. This includes:</p> <ul style="list-style-type: none"> <li>Lighting not designated for dusk-to-dawn operation – astronomical time switch</li> </ul> <p>Lighting designated for dawn-to-dusk</p> <ul style="list-style-type: none"> <li>operation – astronomical time switch or photosensor.</li> </ul> <p>Astronomical time switches are required to have 10 hour battery back-up.</p> <p>Exempts lighting for covered vehicle entrances or exits from buildings, or parking structures where required by safety, security or eye adaptation.</p>	<p>Allows for the use of a photocell in tandem with a time clock or an astronomical time clock for exterior lighting systems that are not designed to stay on from dusk to dawn. Eliminates the lighting control exemption for lights that need to remain on for reasons that pertain to safety, security or eye adaptation.</p>

Topic	2006 IECC	2009 IECC
Total connected interior lighting power.	<p>505.5.1 Provides five exemptions for lighting used for specialized lighting and associated with life/safety including:</p> <ul style="list-style-type: none"> <li>• Specialized lighting for medical and dental</li> <li>• Professional sports arena playing field lighting.</li> <li>• Display lighting for exhibits in galleries, museums and monuments.</li> <li>• Sleeping unit lighting in hotels, motels, boarding houses or similar buildings.</li> <li>• Emergency lighting automatically off during normal building operation.</li> </ul>	<p>Adds exempted lighting that does not need to be considered when calculating the Total Connected Interior Lighting Power including:</p> <ul style="list-style-type: none"> <li>• Lighting in spaces specifically designated for use by occupants with special lighting needs including the visually impaired visual impairment and other medical and age related issues.</li> <li>• Lighting in interior spaces that have been specifically designated as a registered interior historic landmark.</li> <li>• Casino gaming areas.</li> <li>• Task lighting for plant growth or maintenance.</li> <li>• Advertising signage or directional signage.</li> <li>• In restaurant buildings and areas, lighting for food warming or integral to food preparation equipment.</li> <li>• Lighting equipment that is for sale.</li> <li>• Lighting demonstration equipment in lighting education facilities.</li> <li>• Lighting approved because of safety or emergency considerations, inclusive of exit lights.</li> <li>• Lighting integral to both open and</li> </ul>

		glass-enclosed refrigerator and freezer
Topic	2006 IECC	2009 IECC
Total connected interior lighting power (Con't)		<ul style="list-style-type: none"> <li>• cases.</li> <li>• Lighting in retail display windows, provided the display area is enclosed by ceiling height partitions.</li> </ul> Furniture mounted supplemental task lighting that is controlled by automatic shutoff.
Line-voltage lighting track and plug-in busway	505.5.1.4 Requires the code user to use either the actual wattage of the fixtures connected to the track lighting or 30 watts/linear feet, whichever is greater, to document the wattage of a track lighting.	Adds two additional options for documenting the wattage or line-voltage lighting, track and plug-in busway lighting that include: <ul style="list-style-type: none"> <li>• The wattage limit of the system's circuit breaker, or</li> <li>• The wattage limit of other permanent current limiting device(s) on the system.</li> </ul>
Interior lighting power.	<p>Provides a signal column of Lighting Power Densities for all occupancy types that can be used for either a whole building or tenant area or portion of building approach. Reduces the Lighting Power Densities for a portion of the occupancies e.g. Office (1.0 w/ft<sup>2</sup>) and Retail (1.5 w/ft.<sup>2</sup>)</p> <p>Eliminates the increased lighting allowances for Visual Display Terminals, Decorative Lighting and Emergency, Recovery, Medical Supply and Pharmacy Space.</p> <p>Provides and additional 1.6 watts/ft2 for</p>	<p>Revises the display lighting allowances to the following:                      Calculate the additional lighting power as follows:</p> <ul style="list-style-type: none"> <li>• Additional Interior Lighting Power Allowance = 1000 watts + (Retail Area 1 x 0.6 W/ft2) + (Retail Area 2 x 0.6 W/ft2) + (Retail Area 3 x 1.4 W/ft2) + (Retail Area 4 x 2.5 W/ft2),</li> </ul> <p>Where:</p> <ul style="list-style-type: none"> <li>• Retail Area 1 = the floor area for all products not listed in Retail Area 2, 3</li> </ul>

	general merchandise display lighting for up to	or 4.
<b>Topic</b>	<b>2006 IECC</b>	<b>2009 IECC</b>
Interior lighting power (Con't)	50% of the resale floor area and 3.9 watts/ft <sup>2</sup> for the actual shelf or case area for displaying jewelry, china and silver.	<ul style="list-style-type: none"> <li>• Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.</li> <li>• Retail Area 3 = the floor area used for the sale of furniture, clothing, cosmetics and artwork.</li> <li>• Retail Area 4 = the floor area used for the sale of jewelry, crystal, and china.</li> </ul>
Exterior Lighting	<p>Section 505.6 Requires all exterior lighting greater than 100 watts to have a minimum efficacy of 60 lumens per watt unless that lighting is controlled by a motion sensor or is exempted.</p> <p>Requires lighting budgets for all exterior lighting. Includes categories for “Tradable Surfaces” and “Nontradable” Surfaces. Limits the total wattage that can be installed on the exterior of commercial buildings.</p>	<p>Creates exterior lighting zones for exterior lighting based on lighting need. Exterior lighting allowances are defined by the following lighting zones with the highest lighting levels allowed in Zone 4:</p> <p>Zone 1: Developed areas of National Parks, State Parks, Forest Land, and Rural areas</p> <p>Zone 2: Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas</p> <p>Zone 3: All other areas</p> <p>Zone 4: High activity commercial districts in major metropolitan areas as designated by the local land use planning authority.</p> <p>A base lighting allowance is allowed for each</p>

<b>Topic</b>	<b>2006 IECC</b>	<b>2009 IECC</b>
Total building performance approach	<p>Section 506                      Provides requirements for determining the “code building” for a point of comparison to determine if the “proposed building” complies with the IECC using an Energy Cost Budget approach. The requirements are provided in a text format. Defines minimum capabilities for software that is used to demonstrate compliance with the IECC.</p>	<p>lighting zone - from 500 watts to 1,300 watts – for Zones 1 to 4 respectively.</p> <p>Section 506 is rewritten to clarify the requirements for using this section to document compliance with the IECC and for defining what must be included for cost of energy for a minimally code compliant building versus the proposed building.</p> <p>Created table 506.5.1(1) – Specifications for the Standard Reference and Proposed Designs which specifically lists the requirements for determining the energy cost for both the Standard Reference Design and Proposed Design</p>

