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	CHAPTER 1 SCOPE AND ADMINISTRATION	**CHAPTER 1 SCOPE AND ADMINISTRATION**
	C101.4.1 ~~Existing buildings.~~ Mixed occupancy	
	~~C101.4.2 Historic buildings.~~	
	~~C101.4.3 Additions, alterations, renovations or repairs.~~	
	C101.3.2 Information on construction documents. New Section.	
		C102.1 General. This code is not intended to prevent the use of any material~~, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the code official as meeting the intent of this code~~ or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not approved, the code official shall respond in writing, stating the reasons why the alternative was not approved.

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C102.1.1 Above code programs. The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Programs seeking approval must submit all requested supporting documentation, including program guidelines, protocols, calculations and program simulation 0performance software, if applicable, the NNICC and/or jurisdictions for review for use as acceptable software. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met.	**C102.1.1 Above code programs.** The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met.	**C102.1.1 Above code programs.** The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met
		C103.6 Building documentation and closeout submittal requirements. New section added.
		SECTION ~~C104~~ C105 INSPECTIONS. Section renumbered.
	C104.2 Required inspections. Section rewritten.	
	104.4 Approved inspection agencies. Section renumbered and rewritten.	
	CHAPTER 2 DEFINITIONS	**CHAPTER 2 DEFINITIONS**
		ACCESS TO. New definition.
C202 AIR CURTAIN. A device, installed at the building entrance, that generates and	**AIR CURTAIN.** A device, installed at the building entrance, that generates and	

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discharges a laminar airstream intended to prevent the infiltration of external, unconditioned air into the conditioned spaces, or the loss of interior, conditioned air to the outside	discharges a laminar airstream intended to prevent the infiltration of external, unconditioned air into the conditioned spaces, or the loss of interior, conditioned air to the outside	
	ALTERATION. New definition.	
	BELOW-GRADE WALL. New definition.	
	BOILER, MODULATING. New definition.	
	BOILER SYSTEM. New definition.	
	BUBBLE POINT. New definition.	
		CAPTIVE KEY OVERRIDE. New definition.
C202 CASINO. A structure that houses a business with a Non- restricted Gaming License from the Nevada Gaming Commission and State Gaming Control Board. It includes the gaming area(s) as well as the adjacent area(s) within the building envelope.	~~**C202 CASINO.** A structure that houses a business with a Non- restricted Gaming License from the Nevada Gaming Commission and State Gaming Control Board. It includes the gaming area(s) as well as the adjacent area(s) within the building envelope.~~	
C202 CASINO GAMING AREA. The space within a casino where gaming is conducted. The gaming area shall include accessory uses within the same room(s) as, or substantially open to the gaming floor(s). Such areas shall include, but not be limited to lobbies, balconies, public circulation areas, assembly areas, restaurants, bars, lounges, food courts, retail spaces, mezzanines, convention pre-function area, cashier's cages, players clubs, customer support, conservatoires and promenades that share the same	~~**C202 CASINO GAMING AREA.** The space within a casino where gaming is conducted. The gaming area shall include accessory uses within the same room(s) as, or substantially open to the gaming floor(s). Such areas shall include, but not be limited to lobbies, balconies, public circulation areas, assembly areas, restaurants, bars, lounges, food courts, retail spaces, mezzanines, convention pre-function area, cashier's cages, players clubs, customer support, conservatoires and promenades that share the same atmosphere, spillover~~	

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atmosphere, spillover lighting and theme lighting with the adjacent gaming floor area. For accessory areas situated on the perimeter of the gaming floor to be considered substantially open, the wall(s) or partition(s) separating an accessory space from the gaming area must be a minimum of 50%nopen, as measured from the interior side of the accessory space, with no doors, windows or other obstructions, other than roll up security grills, installed within the opening.	~~lighting and theme lighting with the adjacent gaming floor area.~~ ~~For accessory areas situated on the perimeter of the gaming floor to be considered substantially open, the wall(s) or partition(s) separating an accessory space from the gaming area must be a minimum of 50%nopen, as measured from the interior side of the accessory space, with no doors, windows or other obstructions, other than roll up security grills, installed within the opening.~~	
		CAVITY INSULATION. New definition.
		CHANGE OF OCCUPANCY. New definition.
	CIRCULATING HOT WATER SYSTEM. New definition.	
	COMPUTER ROOM. New definition.	
	CONDENSING UNIT. New definition.	
	CONTINUOUS INSULATION. New definition.	
	DAYLIGHT RESPONSIVE UNIT. New definition.	
	DAYLIGHT ZONE. New definition.	
	FAN EFFICEINCY GRADE (FEG). New definition.	
	GENERAL PURPOSE ELECTRIC MOTOT (SUBTYPE I). New definition.	
	GENERAL PURPOSE ELECTRIC MOTOR (SYBTYPE II). New definition.	
	GREENHOUSE. New definition.	

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	HIGH SPEED DOOR. New definition.	
	HISTORIC BUILDING. New definition.	
		IEC DESIGN H MOTOR. New definition.
		IEC DESIGN N MOTOR. New definition.
		ISOLATION DEVICES. New definition.
	LINER SYSTEM (Ls). New definition.	
	LOW-SLOPED ROOF. New definition.	
	LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER. New definition.	
C202 LUMINAIRE. A complete lighting unit consisting of a light source, such as a lamp or lamps, together with parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source, ballast, or distribute the light. A lampholder itself is not a luminaire	~~**C202 LUMINAIRE.** A complete lighting unit consisting of a light source, such as a lamp or lamps, together with parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source, ballast, or distribute the light. A lampholder itself is not a luminaire~~	
		LUMINAIRE-LEVEL LIGHTING CONTROLS. New definition.
		NEMA DESIGN A MOTOR. New definition.
		NEMA DESIGN B MOTOR. New definition.
		NEMA DESIGN C MOTOR. New definition.
		NETWORK GUESTROOM CONTROL SYSTEM. New definition.
OCCUPANT SENSOR (LIGHTING). A device that detects the presence or absence of people within an area and causes lighting to be regulated accordingly. The term "occupant sensor" applies to a device that controls interior lighting systems.	~~**OCCUPANT SENSOR (LIGHTING).** A device that detects the presence or absence of people within an area and causes lighting to be regulated accordingly. The term "occupant sensor" applies to a device that controls interior lighting systems. When the~~	

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When the device is used to control outdoor lighting systems, it is referred to as a motion sensor. This definition also applies to “occupancy sensor” and “occupant-sensing device”.	~~device is used to control outdoor lighting systems, it is referred to as a motion sensor. This definition also applies to “occupancy sensor” and “occupant-sensing device”.~~	
	OCCUPANT SENSOR CONTROL. New definition.	
	OPAQUE DOOR. New definition.	
	POWERED ROO/WALL VENTILATORS. New definition.	
	RFRIGERANT DEW POINT. New definition.	
	REFRIGERATED WAREHOUSE COOLER. New definition.	
	REFRIGERATED WAREHOUSE FREEZER. New definition.	
	REFRIGERATION SYSTEM, LOW TEMPERATURE. New definition.	
	REFRIGERATION SYSTEM, MEDIUM TEMPERATURE. New definition.	
	REGISTERED DESIGN PROFESSIONAL. New definition.	
	REROOFING. New definition	
	ROOF REPAIR. New definition.	
	ROOF REPLACEMENT. New definition.	
	ROOFTOP MONITOR. New definition.	
	SATURATED CONDENSING TEMPERATURE. New definition.	
	VARIABLE REFRIGERANT FLOW SYSTEM. New definition.	
		VOLTAGE DROP. New definition.

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	WALK-IN COOLER. New definition.	
	WALK-IN FREEZER. New definition.	
	WALL, ABOVE-GRADE. New definition.	
	WALL, BELOW-GRADE. New definition.	
	WATER HEATER. New definition.	
	CHAPTER 3 GENERAL REQUIREMENTS	**CHAPTER 3 GENERAL REQUIREMENTS**
	C301.4 Tropical climate zone. New section	
		C303.1.1 Building thermal envelope insulate. Exception. For roof insulation installed above the deck, the R-value shall be labeled as required by the material standards specified in Table 1508.2 of the International Building Code.
	C303.1.3 Fenestration product rating. Exception: Where required, garage door U-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.	**C303.1.3 Fenestration product rating.** Section rewritten.
	C303.1.4.1 Insulated siding. New section.	
		C303.2.2 Multiple layers of continuous insulation board. New section.
	CHAPTER 4 COMMERCIAL ENERGY EFFICIENCY	**CHAPTER 4 COMMERCIAL ENERGY EFFICIENCY**
	C401.2.1 Application to ~~existing buildings~~ replacement fenestration products. Section rewritten.	
	C402.1 General (Prescriptive). Section rewritten.	

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	C402.2 Specific building thermal envelope insulation requirements (Prescriptive). Insulation in building thermal envelope opaque assemblies shall comply with Sections C402.2.1 through C402.2.6 and Table C402.1.3.~~Opaque assemblies shall comply with Table Where two or more layers of continuous insulation board are used in the construction assembly, the continuous insulation boards shall be installed in accordance with Section c302.2. If the continuous insulation board manufacturer's installation instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered. C402.2.~~	
	C402.2.1 Multiple layers of continuous insulation board. Where two or more layers of continuous insulation board are used in the construction assembly, the continuous insulation boards shall be installed in accordance with Section C302.2. If the continuous insulation board manufacturer's installation instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.	~~**C402.2.1 Multiple layers of continuous insulation board.** Where two or more layers of continuous insulation board are used in the construction assembly, the continuous insulation boards shall be installed in accordance with Section C302.2. If the continuous insulation board manufacturer's installation instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.~~
	C402.2.2 Roof assembly. **Exceptions:**	**C402.2.~~2~~ 1 Roof assembly.** The minimum thermal resistance (R-value) of the insulating

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	2. Where tapered insulation is used with insulation entirely above deck, the R-value where the insulation varies 1 inch (25 mm) or less from the minimum thickness of tapered insulation shall comply with the R-value specified in Table 402.1.3. 3. Unit skylight curbs included as a component of an NFRC 100 rated assembly shall not be required to be insulated.	material installed either between the roof framing or continuously on the roof assembly shall be specified in Table C402.1.3, based on the construction materials used in the roof assembly. Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part to the minimum thermal resistance of the roof insulation. Continuous insulation board shall be installed in not less than 2 layers and the edge joints between each layer of insulation shall be staggered. ~~Skylight curbs shall be insulated tot the level of the roofs with insulation entirely above deck or R-5, whichever is less.~~ **Exceptions:** **1.** Continuously insulated roof assemblies where the thickness of the insulation varies 1 inch (25 mm) or less and where the area-weighted U-factor is equivalent to the same assembly with the R-value specified in Table C402.1.3. 2. Where tapered insulation is used with insulation entirely above deck, the R-value where the insulation varies 1 inch (25 mm) or less from the minimum thickness of tapered insulation shall comply with the R-value specified in Table 402.1.3. 3. Unit skylight curbs included as a component of an NFRC 100 rated assembly shall not be required to be insulated. ~~Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered~~

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		~~part to the minimum thermal resistance of the roof insulation.~~
		C402.1.1 Skylight curbs. Skylight curbs shall be insulated tot the level of the roofs with insulation entirely above deck or R-5, whichever is less. **Exception:** Unit skylight curbs included as a component of a skylight listed and labeled in accordance with NFRC 100 shall not be required to be insulated.
	C402.2.3 Thermal resistance of above-ground walls. "Mass walls" shall include walls weighing not less than: 1. Weighing not less than 35 psf (170 kg/m^2) of wall surface area; or 2. Weighing not less than 25 psf (120 kg/m^2) of wall surface area if the material weight is not more than 120 pounds per cubic foot (pcf) (1900 kg/m^3). 3. Having a heat capacity exceeding 5 Btu/ft^2 8 ^{0}F (144 kJ/M^2 * K). 4. Having a heat capacity exceeding 5 Btu/ft^2 * ^{0}F (103 kJ/m^2 8 K), where the material weight is not more than 120 pcf (1900 kg/m^3).	
	C402.2.4 Floors. New section.	**C402.2.3 Floors.** Renumbered and rewritten.
	C402.2.5 ~~Slabs on grade~~ Slabs-on-grade perimeter insulation. Section renamed.	**C402.2.~~5~~ Slabs-on-grade perimeter insulation.** Section renumbered.
		C402.2.5 Below-grade wall. New section inserted**.**

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	C402.2.6 Insulation of radiant heating systems. Section rewritten.	
		C402.2.7 Airspaces. New section.
	C402.3 Roof solar reflectance and thermal emittance. New section inserted.	**C402.3 Roof solar reflectance and thermal emittance.** Section rewritten.
	C402.4.1.1 Increased vertical fenestration area with daylight responsive controls. Section rewritten.	
		C402.1.2 Increased skylight area with daylight responsive controls. The skylight area shall be permitted to be not more than ~~5~~ 6 percent of the roof area provided daylight responsive controls complying with Section C405.2.3.1 are installed in toplit zones ~~daylight zones under skylights~~.
	C402.2.4.2.1 Lighting controls in daylight zones under skylights. Section rewritten.	
C402.4 Air leakage (Mandatory). The thermal envelope of buildings shall comply with Sections C402.4.1 through C402.4.9~~.~~		
	C402.4.2 Minimum skylight fenestration area. Section rewritten.	
		C402.4.4 Daylight zones. New section inserted.
		C402.5 Doors. Opaque swinging doors shall comply with ~~the applicable requirements for doors as specified in~~ Table C402.1.4 ~~3~~. ~~and C402.4 and~~ Opaque nonswinging doors shall comply with Table C402.1.3. Opaque doors shall be considered part of the gross area of above-grade walls that are part of the building thermal

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		envelope. Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration.
C402.7 Vestibules. Exception 7: Doors that have an air curtain with the velocity of not less than 6.56 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.		
C402.4.9 Air curtains. Where doorway, passageway or pass-thru openings in the building thermal envelope are intended to be normally opened to the exterior environment, an approved air curtain tested in accordance with ANSI/AMCA 220 shall be used to separate conditioned area from the exterior.		
	C402.5.1.2.1 Materials (16) Solid and hollow masonry constructed of clay or shale masonry units.	
	C402.5.1.2.2 Assemblies. 2. Masonry walls constructed of clay or shale masonry units with a nominal width of 4 inches (102 mm) or more.	

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	3. A Portland cement/sand purge, stucco or plaster not less than 1/2 inch (12.7 mm) in thickness.	
	C402.5.3 Rooms containing fuel-burning appliances. New section.	**C402.5.3 Rooms containing fuel-burning appliances.** Section rewritten.
	C402.5.7 Vestibules. **Exception 7.** Doors that have an air curtain with a velocity of not less than 6.56 feet per section (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.	
	C402.5.8 Recessed lighting. New section.	
		C403.2 System design (Mandatory). Relocated rewritten section inserted along with associated sub-sections.
	TABLE C403.2.3 (1). Amended. **TABLE C403.2.3 (2).** Amended.	.
	TABLE C403.2.3 (3). Amended.	
	TABLE C403.2.3(7). Amended.	
	TABLE C403.2.3 (8). Amended.	
	C403.2.3.1 Water-cooled centrifugal chilling packages.	

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	~~**Exception:** Centrifugal chillers designed to operate outside of these ranges need not comply with this code.~~	
	C403.2.4.1.2 Deadband. New section.	
	C403.2.4.1.3 Set point overlap restriction. Section rewritten.	
	C403.2.4.3 Shutoff dampers. New section.	
	C403.2.4.4 Zone isolation. New section.	
	C403.2.4.6 Economizer fault detection and diagnostics (FDD). New section.	
	C403.2.5 Hot water boiler outdoor temperature setback control. New section.	
	C403.2.6.2 Enclosed parking garage ventilation controls. New section.	
	TABLE C403.2.7(1). New table.	
	TABLE C403.2.7(2). New table.	
	C403.2.7 Energy recovery ventilation systems. **Exceptions:** ~~10. Systems exhausting toxic, flammable, paint or corrosive fumes and dust.~~ ~~11. Commercial cooking hoods used for collecting and removing grease vapors and smoke.~~	
	C403.2.8 Kitchen exhaust systems. New section.	
	TABKE C403.1.12.1(2. Amended.	
	C403.2.14 Refrigeration equipment performance. New section.	
	TABLE C403.2.14(1). New table.	

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	TABLE C403.2.14(2). New table.	
	C403.2.15 Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers. New section.	
	C403.2.16 Walk-in coolers and walk-in freezers. New section.	
	C403.2.17 Refrigerated display cases. New section**.**	
	C403.3 Economizer (Prescriptive). Section rewritten**.**	**C403.3 Heating and cooling equipment efficiencies (Mandatory).** Relocated rewritten section inserted along with associated sub-sections.
	C403.3.1.3 Integrated economizer control. Section rewritten.	
	C403.3.4 Water-side enconomizers. New section**.**	
	C403.4 Hydronic and multiple-zone HVAC systems controls and equipment (Prescriptive). New section**.**	**C403.4 Heating and cooling system controls (Mandatory).** Relocated rewritten section inserted along with associated sub-sections.
	C403.5 Refrigeration systems. New section**.**	**C403.5 Economizers (Prescriptive).** Relocated rewritten section inserted along with associated sub-sections.
		C403.6 Requirements for mechanical systems serving multiple zones. Relocated rewritten section inserted along with associated sub-sections.

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		C403.7 Ventilation and exhaust systems. Relocated rewritten section inserted along with associated sub-sections.
		C403.8 Fans and fan controls. Relocated rewritten section inserted along with associated sub-sections.
		C403.9 Heat rejection equipment. Relocated rewritten section inserted along with associated sub-sections.
		C403.10 Refrigeration equipment performance. Relocated rewritten section inserted along with associated sub-sections.
		C403.11 Construction of HVAC system elements. New section.
		C403.12 Mechanical systems located outside of the building thermal envelope (Mandatory). New section.
		C404.3 Heat traps for hot water storage tanks. Water-heating equipment not supplied with integral heat traps and serving noncirculating systems shall be provided with heat traps on the supply and discharge piping associated with the equipment. <u>Storage tank-type water heaters and hot water storage tanks that have vertical water pipes connecting to the inlet and outlet of the tank and shall be provided with integral heat traps at those inlets and outlets or shall have pipe-configured heat traps in the piping connected to those inlets and outlets. Tank inlets and outlets associated with solar water heating</u>

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		system circulation loops shall not be required to have heat traps.
	C404.4 Insulation of piping. Section.	.
	C404.5 Efficient heated water supply piping. Section.	
	C404.6 Heated-water circulating and temperature maintenance system. Section.	
	C404.7 Demand recirculation controls. Section.	
	C404.8 Drain water heat recovery units. Section.	
	C404.9 Energy consumption of pools and permanent spas (Mandatory). Section.	
		C404.9.3 Covers. **Exception:** Where more than ~~70~~ 75 percent of the energy fir heating, computed over an operating season, of not fewer than 3 calendar months, is from site-recovered energy such as from a heat pump or solar energy source, ~~on-site renewable energy system,~~ cover or other vapor-retardant means shall not be required.
	C404.10 Energy consumption of portable spas (Mandatory). Section.	
	C404.11 Service water-heating system commissioning and completion requirements. Section.	
		C405.1 General (Mandatory). This section covers lighting system controls, the maximum lighting power for interior and exterior applications and electrical energy consumption.

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		Exception: Dwelling units within commercial buildings shall not be required to comply with Sections C405.2 through C405.5, provided that they comply with Section R404.1. Dwelling units within multifamily buildings shall comply with Section R404.1. All other dwelling units shall comply with Section R404.1, or with Sections C405.2.4 and C405.3. Sleeping units shall comply with Section 405.2.5 and with Section R404.1 or C405.3. Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section ~~C403.2.15 or C403.2.16~~ C403.10.1 or C403.10.2.
	C405.2 Lighting controls (Mandatory). Section rewritten**.**	**C405.2 Lighting controls (Mandatory).** Section rewritten**.**
	C405.2.1 Occupant sensor controls. Section rewritten.	
	C405.2.2 Time-switch controls. Section rewritten**.**	
	C405.2.3 Daylight-responsive controls. Section rewritten**.**	**C405.2.3 Daylight-responsive controls.** **Exception 4.** New exception.
		C405.2.3.3 Toplit zone. **2.** Where the fenestration is located in a rooftop monitor, the toplit zone shall extend laterally to the nearest obstruction that is taller than 0,7 times the ceiling height, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest obstruction that is taller than 0.7 times the

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		ceiling height , or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures C405.2.3.3(2) and C405.2.3.3(3).
		C405.2.4 Specific application controls. Section rewritten.
		C405.2.5 Manual controls. New section inserted.
	C405.2.5 Exterior lighting control. Section rewritten**.**	**C405.2.~~5~~ 6 Exterior lighting control.** Section renumber and rewritten, including sub-sections**.**
		C405.3.1 Total connected interior lighting power. Section rewritten.
	C405.5.1 Total connected interior lighting power. **Exception 15.** Exit signs	
	C405.2.2.1 Additional interior lighting power. New section**.**	
		C405.4.1 Total connected exterior building exterior lighting power. Section renumbered and rewritten.
		C405.4.2 Exterior lighting power allowance. New section.
		C405.4.2.1 Additional exterior lighting power. New section.
		C405.4.3 Gas lighting (Mandatory). New section**.**

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	C405.6 Electrical energy consumption (Mandatory). New section.	
	C405.7 Electrical transformer (Mandatory). New sections.	
	C405.8 Electrical motors (Mandatory). New sections.	**C405.~~8~~ 7 Electrical motors (Mandatory).** Renumbered. **Exceptions:** The standards in this section shall not apply to the following exempt electric motors: 1. Air-over electric motors. 2. Component sets of an electric motor. 3. Liquid-cooled electric motors. 4. Submersible electric motors. 5. Inverter- only electric motors
		C405.8.2 Escalators and moving walks. **Exception:** A variable voltage drive system that reduces operating voltage in response to light loading conditions is an alternative to the reduced speed function.
	C405.9 Vertical and horizontal transportation systems and equipment. New section.	

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	TABLE C405.7. New table.	
	TABLE C405.8(1) through TABLE C405.8(4). New tables.	
	C406.1 Requirements. Buildings shall comply with at least one of the following; 1. ~~Efficient HVAC Performance in accordance with Section C406.2.~~ More efficient HVAC performance with Section 406.2. 2. ~~Efficient Lighting System~~ Reduced lighting power density system in accordance with Section C406.3. 3. Enhanced lighting controls in accordance with Section C406.4. 4. On-site ~~Supply of Renewable Energy~~ supply of renewable energy in accordance with Section C406.4. 5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6. 6. High-efficiency service eater heating in accordance with Section C406.7. ~~Individual tenant spaces shall comply with either Section C406.2 or Section C406.3 unless documentation can be provided that demonstrates compliance with Section C406.4 for the entire building.~~	**C406.1 Requirements.** Buildings shall comply with at least one of the following; 1. More efficient HVAC performance with Section 406.2. 2. Reduced lighting power density system in accordance with Section C406.3. 3. Enhanced lighting controls in accordance with Section C406.4. 4. On-site supply of renewable energy in accordance with Section C406.4. 5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6. 6. High-efficiency service eater heating in accordance with Section C406.7. 7. Enhanced envelope performance in accordance with Section C406.8 8. Reduced air infiltration in accordance with Section C406.9.
	C406.1.1 Individual tenant spaces. Tenant spaces shall comply with ~~either~~ Section C406.2, C406.3, C406.4, C406.6 or 406.7. Alternatively, tenant spaces shall comply	**C406.1.1 Individual tenant spaces**. Tenant spaces shall comply with Section C406.2, C406.3, C406.4, C406.6 or 406.7. Alternatively, tenant

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	with Section C406.5 where the entire building is in compliance. ~~unless documentation can be provided that demonstrates compliance with Section C406.4 for the entire building.~~	spaces shall comply with Section C406.5 where the entire building is in compliance. **Exception:** Previously occupied tenant spaces that comply with this code in accordance with Section C501.
	C406.2 More efficient HVAC equipment performance. Equipment shall ~~meet~~ exceed the minimum efficiency requirements of TablesC406.2(1) through aC406.2(7) by 10 percent, in addition to the requirements in Section C403. Where multiple performance requirements are provided, the equipment shall exceed all requirements by 10 percent. Variable refrigerant flow systems shall exceed the energy efficiency provisions of ANIS/ASHRAE/IES 90.1 by 10 percent. ~~This section shall only be sued where the equipment efficiencies~~ Equipment not listed in Tables TablesC406.2(1) through aC406.2(7) shall be limited to 10 percent of the total building system capacity. ~~are greater than the equipment efficiencies listed in Table C403.2.3(1) through C403.2.3(7) for the equipment type.~~	
	C406.3~~.1~~ Reduced lighting power density. The total interior lighting power (watt) of the building shall be determined by using 90 percent of the ~~reduced whole building interior~~ lighting power allowances calculated by the Space-by-Space Method	

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	in Section C405.4.2. ~~Table C406.3 times the floor area for the building types.~~	
	C406.4 Enhanced digital lighting controls. New section.	
	C406.6 Dedicated outdoor air system. New section.	
		C406.8 Enhanced envelope performance. New section.
		C406.9 Reduced air infiltration. New section.
		C407.1 Scope. **Exception:** Energy used to recharge or refuel vehicles that are used for on-road and off-site transportation purposes.
		C407.3 Performance-based compliance. Compliance based on total building performance requires that a proposed building (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations. ~~Nondepletable energy collected on site shall be omitted from the annual energy cost of the proposed design.~~ The reduction in energy cost of the proposed design associated with on-site renewable energy shall be not more than 5 percent of the total energy cost. The amount of

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		renewable energy purchased from off-site sources shall be the same in the standard reference design and the proposed design.
		C407.4.2 Additional documentation. 6. Documentation of the reduction in energy use associated with on-site renewable energy.
		C407.5.2.3 ~~Multifamily residential buildings~~ Group R-2 occupancy buildings.
	C407.6.3 Exceptional calculation methods. New section.	
		C408.1.1 Building operations and maintenance information. New section inserted.
C408.2 Mechanical systems commissioning and completion requirements. Prior to passing the final mechanical inspection, the registered design professional shall provide evidence of mechanical systems commissioning and completion in accordance with the provisions of this section. A properly licensed contractor that is the designer and has prepared the mechanical or plumbing drawing for the project may perform the commissioning as required in C408.2.1 and C408.2.4 of this code. The contractor shall be required to carry insurance in the form of Professional Liability or Error and Omissions Insurance.	**C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements.** Prior to ~~passing~~ the final mechanical and plumbing inspection, the registered design professional shall provide evidence of mechanical systems commissioning and completion in accordance with the provisions of this section. Construction document notes shall clearly indicate provisions for commissioning and completion requirement in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documents shall be given to the owner or owner's authorized representative and made available to the code official upon request in accordance with sections C408.2.4 and C408.2.5.	

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Construction document notes shall clearly indicate provisions for commissioning and completion requirement in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documents shall be given to the owner and made available to the code official upon request in accordance with sections C408.2.4 and C408.2.5. **Exceptions:** The following systems are exempt from commissioning requirements: 1. Mechanical systems in buildings where the total me 2. mechanical equipment capacity is less than 480,000 Btu/h (140 690 W) cooling capacity and 600,000 Btu/h (175 860 W) heating capacity. 3. Systems included in section C403.3 that serve dwelling units and sleeping units in hotels, motels, boarding houses or similar units.	**Exceptions:** The following systems are exempt ~~from commissioning requirements~~: 1. Mechanical <u>systems and service water heater systems in buildings where the total mechanical</u> equipment capacity is less than 480,000 Btu/h (140 690 W) cooling capacity and 600,000 Btu/h (175 860 W) <u>combined service water-heating and space-</u>heating capacity. 2. Systems included in section C403.3 that serve <u>individual</u> dwelling ~~units~~ and sleeping units ~~in hotels, motels, boarding houses or similar~~ units.	
		C408.2.4 Preliminary commissioning report. **4.** <u>Results of functional performance tests.</u> **5.** <u>Functional performance test procedures used during to commissioning process, including measurable criteria for test acceptance.</u>

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C408.2.5 Documentation requirements. The construction documents shall specify that the documents described in this section be provided to the building owner ~~within 90 days of the date of~~ and the Building Official prior to receipt of the Certification of occupancy	**C408.2.5 Documentation requirements.** See C408.3.2	
	C408.3.1.1 Occupant sensor controls. New section.	
	C408.3.1.2 Time-switch controls. New section.	
	C408.3.1.3 Daylight responsive controls. New section.	
	C408.3.2 Documentation requirements. The construction documents shall specify that documents certifying that the installed lighting controls meet documented performance criteria of Section C405 are to be provided to the building owner within 90 days from the date of receipt of the certificate of occupancy.	
		C408.3.2.1 Drawings. New section.
		C408.3.2.2 Manuals. New section. **C408.3.2.3 Report.** New section.
	CHAPTER 5 EXISTING BUILDINGS. New chapter added.	**CHAPTER 5 EXISTING BUILDINGS**
		C503.2 Change in space conditioning. **Exceptions:** **1.** Where the component performance alternative in Section C402.1.5 is used to comply with this section, the proposed

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		UA shall not be greater than 110 percent of the target UA. **2.** Where the total building performance option in Section C407 is used to comply with this section, the annual energy cost of the proposed design shall be not greater than 110 percent of the annual energy cost otherwise permitted by Section C407.3.
		C503.3 Building envelope: **Exception:** Where the existing building exceeds the fenestration area limitations of Section C402.1 prior to alteration, the building is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.
		C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code. Where the use in a space changes from one use in Table C405.4.2(1) or C405.4.2(2) to another use in Table C405.4.2(1) or C405.4.2(2), the installed lighting wattage shall comply with Section C405.4.
Chapter 5 Referenced Standards: UMC-2012 and UPC-2012 added to referenced standards.	**Chapter ~~5~~6 Referenced Standards:** ~~UMC-2012 and UPC-2012 added to referenced standards.~~	**Chapter ~~5~~6 Referenced Standards:** ~~UMC-2012 and UPC-2012 added to referenced standards.~~
R102.1.1 Above code programs. The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency	**R102.1.1 Above code programs.** The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency	

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program to exceed the energy efficiency required by this code. Programs seeking approval must submit all requested supporting documentation, including program guidelines, protocols, calculations and program simulation 0performance software, if applicable, the NNICC and/or jurisdictions for review for use as acceptable software. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met.	program to exceed the energy efficiency required by this code. ~~Programs seeking approval must submit all requested supporting documentation, including program guidelines, protocols, calculations and program simulation 0performance software, if applicable, the NNICC and/or jurisdictions for review for use as acceptable software.~~ Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 shall be met.	
	R103.2.1 Building thermal envelope depiction. New section.	
	R103.3 Examination of documents. The code official shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The code official is authorized to utilize a registered design professional, or other approved entity not affiliated with the building, design or construction, in conducting the review of the plans and specifications for compliance with the code.	
	R104.2 Required inspections. Inserted new section.	

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		R202 AIR-IMPERMEABLE INSULATION. New definition.
	R202 CIRCULATING HOT WATER SYSTEM. New definition.	
	R202 CONTINUOUS INSULATION. New definition.	
	R202 ERI REFERENCE DESIGN. New definition.	
	R202 HISTORIC BUILDING. New definition.	
	R202 INSULATED SIDING. New definition.	
	R202 RATED DESIGN. New definition.	
	R202 REROOFING. New definition.	
	ROOF RECOVER. New definition.	
	ROOF REPAIR. New definition.	
	ROOF REPLACEMENT. New definition.	
	VERTICAL FENESTRATION. New definition.	
	R301.4 Tropical climate zone. New section.	
	R303.1.3 Fenestration product rating. **Exception:** Where required, garage door U-factors shall be determined in accordance with NFRC 100.	
	R303.1.4.1 Insulated siding. New section.	
	R401.2.1 Tropical zone. New section inserted.	
R401.3 Certificate (Mandatory). ~~A permanent certificate~~ The builder shall provide the owner a certificate ~~shall be completed and posted on or near the~~	**R401.3 Certificate (Mandatory).** A permanent certificate shall be completed and posted on a wall in the space where the furnace is located, a utility room or an	

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~~electrical distribution panel by the builder or registered design professional~~ approved by the jurisdiction. ~~The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other labels.~~ The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor) and ducts outside of conditioned spaces; U-factors for fenestration and solar heat gain coeffivient (SHGC) of fenestration, and the result from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value for the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. ~~Where a gas fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas fires unvented room~~	approved location inside of the building. ~~or near the electrical distribution panel by the builder or registered design professional approved by the jurisdiction.~~ Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other labels. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor) and ducts outside of conditioned spaces; U-factors for fenestration and solar heat gain coeffivient (SHGC) of fenestration, and the result from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value for the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas fires unvented room	

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~~heaters, electric furnaces or electric baseboard heaters.~~	heaters, electric furnaces or electric baseboard heaters.	
	R402.1 General (Prescriptive) **Exception:** The following low-energy buildings, or portions thereof, separated from the remainder of the building by building thermal envelope assemblies complying with this section shall be exempt from the building thermal envelope provisions of Section R402. 1. Those s=with a peak design rate of energy usage less than 3.4 Btu/h * ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 of the floor area for space-conditioning purposes. 2. The that do not contain conditioned spaces.	**R402.1 General (Prescriptive)** **Exception:** 1. The following low-energy buildings, or portions thereof, separated from the remainder of the building by building thermal envelope assemblies complying with this section shall be exempt from the building thermal envelope provisions of Section R402. **1.1** Those s=with a peak design rate of energy usage less than 3.4 Btu/h * ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 of the floor area for space-conditioning purposes. **1.2** 1.2 The that do not contain conditioned spaces. **2.** Log homes designed I accordance with ICC 400.
	R402.1.1 Vapor retarder. New section.	
	R402.2.4 Access hatches and doors. **Exception:** Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R402.1.2 based upon the applicable climate zone specified in Chapter 3.	
	R402.2.5 Mass walls. Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF),	

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	masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs, or any other walls having a heat capacity greater than or equal to 6 Btu/ft^2 x ^{0}F (123 kJ/m^2 x K).	
	R402.2.7 Walls with partial structural sheathing. Inserted new section.	
	R402.2.8 Floors. **Exception:** The floor framing-cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum wood frame wall R-value in Table 402.1.2 and that extends from the bottom to the top of all perimeter floor framing members.	
	R402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements. Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R402.1.2 provided the ration of the higher to lower labeled SG+HGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in	

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	multiple steps. Dynamic glazing shall be considered separately from other fenestration, and are-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted. **Exception:** Dynamic glazing is not required to comply with this section when both the lower and higher labeled SHGC already comply with the requirements of Table R402.1.2.	
R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour ~~in Climate Zones 1 and 2 , and 3 air changes per hour in Climate Zones 4 through 8.~~ Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascal's). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope. During testing: 1. Exterior windows and doors, fireplace and stove doors shall be closed but not sealed, beyond the	**R402.4.1.2 Testing.** The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour in Climate Zones 1 and 2 , and 3 air changes per hour in Climate Zones 4 through 8.-Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported ~~with a blower door~~ at a pressure of 0.2 inches w.g. (50 Pascal's). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope. During testing: 1. Exterior windows and doors, fireplace and stove doors shall be closed but not sealed, beyond the	

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intended weather-stripping or other infiltration control measures; 2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures; 3. Interior doors, if installed at the time of test, shall be open; 4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed; 5. Heating and cooling systems, if installed at the time of test, shall be turned off; and supply and return registers, if installed at the time of test, shall be fully open.	intended weather-stripping or other infiltration control measures. 2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures. 3. Interior doors, if installed at the time of test, shall be open. 4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed. 5. Heating and cooling systems, if installed at the time of test, shall be turned off~~.; and supply and return registers, if installed at the time of test, shall be fully open~~. upply and return registers, if installed at the time of test, shall be fully open.	
	R402.4.2 Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace. Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907.	

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	R402.4.4 Rooms containing fuel-burning appliances. New section inserted.	
	TABLE R402.1.1. New table.	
	R403.2 Hot water boiler outdoor temperature setback. New section inserted.	
	R403.3 Ducts. Section rewritten.	
R403.3.2 Sealing (Mandatory). Ducts air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or International Residential Code, as applicable. **Exceptions:** 1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals. 2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect. 3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less the 2 inches of water column (500 pa) pressure classification shall not require additional closure systems.	**R403.3.2 Sealing (Mandatory).** Ducts air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or International Residential Code, as applicable. **Exceptions:** 1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals. ~~2.~~ For ducts having a static pressure classification of less the 2 inches of water column (500 pa), additional closure systems shall not be required for continuously welded joints and seams, and locking -type joints and seams of other than the snap-lock and button-lock types. ~~Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of~~	

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Duct tightness shall be verified by either of the following: 1. Postconstruction test: Total leakage shall be less than or equal to ~~4 cfm (113.3 L/min)~~ 6 cfm (169.9 L/Min) of Total leakage to outside shall be less than or equal to 4 cfm (113.3 L/Min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handling enclosure. All register boots shall be taped or otherwise sealed during the test. 2. Rough-in test: Total leakage shall be less than or equal to ~~4 cfm (113.3 L/min)~~ 6 cfm (169.9 L/Min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the	~~the joint so as to prevent a hinge effect.~~ ~~3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less the 2 inches of water column (500 pa) pressure classification shall not require additional closure systems.~~ ~~Duct tightness shall be verified by either of the following:~~ ~~1. Postconstruction test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) 6 cfm (169.9 L/Min) of Total leakage to outside shall be less than or equal to 4 cfm (113.3 L/Min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handling enclosure. All register boots shall be taped or otherwise sealed during the test.~~ ~~2. Rough-in test: Total leakage shall be less than or equal to 4 cfm (113.3 L/min) 6 cfm (169.9 L/Min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure~~	

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test, total leakage shall be less than or equal to ~~3 cfm (85 L/min)~~ 5 cfm (141.6 L/Min) per 100 square feet (9.29 m^2) of the conditioned floor area. **Exception:** The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.	~~differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) 5 cfm (141.6 L/Min) per 100 square feet (9.29 m^2) of the conditioned floor area.~~ ~~**Exception:** The total leakage test is not required for ducts and air handlers located entirely within the building thermal envelope.~~	
		R403.3.3 Duct testing. **Exceptions:** **1.** A duct air-leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope. **2.** A duct air-leakage test shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems.
		R403.3.6 Ducts buried within ceiling insulation. New section.
		R403.3.6.1 Effective R-value of deeply buried ducts. New section.

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		R403.3.7 Ducts located in conditioned spaces. New section
	R403.4 Mechanical system piping insulation. Section rewritten.	
	R403.5 Service hot water systems. Section rewritten.	
	R403.7 Equipment sizing and efficiency rating (Mandatory). Section rewritten**.**	
	R403.8 Systems serving multiple dwelling units (Mandatory). Section rewritten**.**	
	R403.9 Snow melt and ice system controls (Mandatory). Section rewritten**.**	
		R403.10.3 Covers. **Exception:** Where more than ~~70~~ 75 percent of the energy for heating, computed over an operation season of not less than three calendar months, is from site-recovered energy, such as a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.
	R403.11 Portable spas (Mandatory). New section**.**	
	R403.12 Residential pools and permanent residential spas (Mandatory). New section**.**	
Section R403.5 Mechanical ventilation (Mandatory). The building (dwelling) shall be provided with ventilation that meets one of the following requirements: ~~of the International Residential Code or~~		

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~~International Mechanical Code , as applicable, or with other~~ 1. Mechanical ventilation rate shall provide outdoor air as calculated using the following formula: [0.01 x CFA + 7.5 x (N_{br} +1)] where CFA = conditioned floor area, N_{br}= number of bedrooms; 2. Minimum outdoor air ventilation rate may be achieved using 2102 IRC Table M1507.3.3(1); or 3. Other approved means of ventilation using ASHRAE 62.2-2013. The mechanical system shall have a readily accessible on-off control switch allowing control of the mechanical system. Utilization of outside air temperature sensors, carbon dioxide sensors, humidity sensors, motion sensors or similar interment controls to activate the outside air mechanical equipment is permitted. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not working.		
		R404.1 Lighting equipment (Mandatory). Not less than ~~75~~ 90 percent of the ~~lamps in permanently installed lighting fixtures shall be~~

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		~~high-efficacy lamps or not less than 75 percent of the~~ permanently installed lighting fixtures shall contain only high-efficacy lamps. ~~**Exception:** Low-voltage lighting.~~
	R405.4.2 Compliance report. Section rewritten.	
	R405.4.2.1 Compliance report for permit application. New section.	
	R405.4.2.2 Compliance report for certificate of occupancy. New section.	
	SECTION R406 ENERGY RATING INDEX COMPLIANCE ALTERNATIVE. New section.	
R406.1 Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.	**R406.1 Scope.** This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.	
R406.2 Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in Sections R401.2 and R403.5.3 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.2 or 402.1.4 of the 2009 International Energy Conservation Code. **Exception:** Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.	**R406.2 Mandatory requirements.** Compliance with this section requires that the mandatory provisions identified in Sections R401.2 and R403.5.3 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.2 or 402.1.4 of the 2009 International Energy Conservation Code. **Exception:** Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.	
R406.3 Energy Rating Index. The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear	**R406.3 Energy Rating Index.** The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale	

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scale constructed such that the ERI reference design has an Index value of 100 and a residential that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design. The ERI shall consider all energy used in the residential building.	constructed such that the ERI reference design has an Index value of 100 and a residential that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design. The ERI shall consider all energy used in the residential building.	
R406.3.1 ERI reference design. The ERI reference design shall be configured such that it meets the minimum requirements of the 2006 International Energy Conservation Code prescriptive requirements. The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.	**R406.3.1 ERI reference design.** The ERI reference design shall be configured such that it meets the minimum requirements of the 2006 International Energy Conservation Code prescriptive requirements. The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.	
R406.4 ERI-based compliance. Compliance based upon an ERI analysis requires that the rated design be shown to have an ERI less than or equal to 63.	**R406.4 ERI-based compliance.** Compliance based upon an ERI analysis requires that the rated design be shown to have an ERI less than or equal to the appropriate value listed in Table R406.4 when compared to the ERI reference design. ~~63.~~	
R406.5 Verification by approved agency. Verification of compliance with Section	**R406.5 Verification by approved agency.** Verification of compliance with Section	

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R406 shall be completed by an approved third party.	R406 shall be completed by an approved third party.	
	TABLE R406.4. New table.	
R406.6 Documentation. Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections R406.6.1 through R406.6.3.	**R406.6 Documentation.** Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections R406.6.1 through R406.6.3.	
R406.6.1 Compliance software tools. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.	**R406.6.1 Compliance software tools.** Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.	**R406.6.1 Compliance software tools.** ~~Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.~~ Software tools used for determining ERI shall be Approved Software Rating Tool in accordance with RESNET/ICC 301.
R406.6.2 Compliance report. Compliance software tool shall generate a report that documents that the ERI of the rated design complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information: 1. Address or other identification of the residential building. 2. An inspection checklist documenting the building component characteristics of the rated design. The inspection checklist shall show results for both the ERI reference design. The inspection checklist shall show results for both the ERI	**R406.6.2 Compliance report.** Compliance software tool shall generate a report that documents that the ERI of the rated design complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information: 1. Address or other identification of the residential building. 2. An inspection checklist documenting the building component characteristics of the rated design. The inspection checklist shall show results for both the ERI reference design. The inspection checklist shall show results for both the ERI reference design and the rated	

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reference design and the rated design and shall document all inputs entered by the user necessary to reproduce the results. 3. Name of individual completing the compliance report. 4. Name and version of the compliance software tool. **Exception:** Multiple orientations. Where an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four (north, east, south and west) cardinal orientations.	design and shall document all inputs entered by the user necessary to reproduce the results. 3. Name of individual completing the compliance report. 4. Name and version of the compliance software tool. **Exception:** Multiple orientations. Where an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four (north, east, south and west) cardinal orientations.	
R406.6.3 Additional documentation. The code official shall be permitted to require the following documents: 1. Documentation of the building component characteristic of the ERI reference design. 2. A certification signed by the builder providing the building component characteristics of the rated design.	**R406.6.3 Additional documentation.** The code official shall be permitted to require the following documents: 1. Documentation of the building component characteristic of the ERI reference design. 2. A certification signed by the builder providing the building component characteristics of the rated design. **3.** Documentation of the actual values used in the software calculations for the rated design	

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3. Documentation of the actual values used in the software calculations for the rated design.		
		R406.6.4 Specific approval. New section.
		R406.6.5 Input values. New section.
R406.7 Calculation software tools. Calculation software, where used, shall be in accordance with Sections R406.7.1 through R407.7.3.	**R406.7 Calculation software tools.** Calculation software, where used, shall be in accordance with Sections R406.7.1 through R407.7.3.	
R406.7.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities: 1. Computer generation of the ERI reference design using only the input for the rated design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the ERI reference design. 2. Calculation of the while building as a single zone, sizing the heating and cooling equipment in the ERI reference design residence in accordance with Section R403.7. 3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios	**R406.7.1 Minimum capabilities.** Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities: 1. Computer generation of the ERI reference design using only the input for the rated design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the ERI reference design. 2. Calculation of the while building as a single zone, sizing the heating and cooling equipment in the ERI reference design residence in accordance with Section R403.7. 3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating,	

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on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing. 4. Printed code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.	ventilating and air-conditioning equipment based on climate and equipment sizing. Printed code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.	
R406.7.2 Specific approval. Performance analysis tools meeting the applicable sections of Section R406 shall be approved. Tools are permitted to be approved based upon meeting a specified threshold for a jurisdiction. The code official shall approve tools for a specified application or limited scope.	**R406.7.2 Specific approval.** Performance analysis tools meeting the applicable sections of Section R406 shall be approved. Tools are permitted to be approved based upon meeting a specified threshold for a jurisdiction. The code official shall approve tools for a specified application or limited scope.	
R406.7.3 Input values. When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an approved source.	**R406.7.3 Input values.** When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an approved source.	
	CHAPTER 5 EXISTING BUILDINGS. New chapter added.	
Chapter 5 Referenced Standards: UMC-2012 and UPC-2012 added to referenced standards.	**Chapter ~~5~~ 6 Referenced Standards:** ~~UMC-2012 and UPC-2012 added to referenced standards~~	**Chapter 6 Referenced Standards:** ~~UMC-2012 and UPC-2012 added to referenced standards~~
	APPENDIX RA RECOMMENDED PROCEDURE FOR WORST-CASE TESTING OF	**~~APPENDIX RA RECOMMENDED PROCEDURE FOR WORST-CASE TESTING OF ATMOSPHERIC~~**

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	ATMOSPHERIC VENTING SYSTEMS UNDER R402.4 0R R405 CONDITIONS < 5 EACH. New Appendix added.	~~**VENTING SYSTEMS UNDER R402.4 0R R405 CONDITIONS < 5 EACH.** New Appendix added~~
	APPENDIX PROVISIONS- DETACHED ONE- AND TWO-FAMILY DWELLINGS, MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES). New Appendix added.	**APPENDIX PROVISIONS- DETACHED ONE- AND TWO-FAMILY DWELLINGS, MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES).**