

Building Energy Performance Characteristics  
 For Compliance with Commercial Provisions, Chapter 4 of 2012 IECC

Project:

Project Location:

See the instructions and disclaimer for this spreadsheet.

	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
Total Building Performance, Annual Energy Cost	For Standard Reference Design Building			
Compliance is demonstrated when the proposed building's energy cost is equal to or less than 85 percent of the standard reference design building's energy cost.	For Proposed Design Building			
<b>Section C402</b>				
<b>Building Envelope (Climate Zone 5A)</b>				
Space-Conditioning Category (Nonresidential or Residential)				
Gross Roof Area				
Roofs: Maximum Assembly U-factor				
Minimum Insulation R-Value				
Walls: Above-Grade: Maximum Assembly U-factor				
Above-Grade: Minimum Insulation R-Value				
Below-Grade: Maximum Assembly C-factor				
Below-Grade: Minimum Insulation R-Value				
Floors: Maximum Assembly U-factor				
Minimum Insulation R-Value				
Slab-On-Grade - Maximum Assembly F-factor				
Slab-On-Grade - Minimum Insulation R-Value				
Opaque Doors: Maximum Assembly U-factor				
Maximum Assembly R-Value				
Radiant Heating System Insulation				
Gross Wall Area				
Total Vertical Fenestration Area				
Vertical Glazing: Percent of Wall Area				
Increased Vertical Fenestration Area with Daylighting Control				
Vertical Glazing				
Maximum Assembly U-factor				
Maximum Assembly Solar Heat Gain Coefficient				
Increased Skylight Area with Daylighting Controls				
Required Minimum Skylight Fenestration Area with Daylighting Control				
Total Skylight Area				
Skylight: Percent of Roof Area				
Skylight: Maximum Assembly U-factor				
Maximum Assembly Solar Heat Gain Coefficient				
Visible Transmittance (VT)				
Haze Factor				
Air Barriers:				
Construction				
Compliance Option (Materials, Assemblies or Building Testing)				
Penetration Sealing				
Maximum Assembly Air Leakage Rates				
Maximum Air Leakage Rates, Recessed Lighting Luminaires				
Damper, Maximum Leakage Rate				
Loading Dock Weatherseal				
Vestibule				
<b>Section C403</b>				
<b>Heating, Ventilating and Air Conditioning</b>				
Calculated Load	Heating			
	Cooling			
Equipment Output Capacity	Heating			
	Cooling			
HVAC Equipment Performance				
Unitary Air Conditioners, Electrically Operated, Minimum Efficiency				
Condensing Units, Electrically Operated, Minimum Efficiency				
Unitary and Applied Heat Pumps, Electrically Operated, Minimum Cooling Mode Efficiency				

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
Unitary and Applied Heat Pumps, Electrically Operated, Minimum <b>Heating Mode</b> Efficiency				
Package Terminal Air Conditioners (Cooling Mode) Minimum Efficiency				
Package Terminal Heat Pumps (Cooling Mode) Minimum Efficiency				
Package Terminal Heat Pumps (Heating Mode) Minimum Efficiency				
Single Package Vertical Air Conditioner (Cooling Mode) Minimum Efficiency				
Single Package Vertical Heat Pump (Cooling Mode) Minimum Efficiency				
Single Package Vertical Heat Pump (Heating Mode) Minimum Efficiency				
Room Air Conditioners, Minimum Efficiency				
Room Air Conditioner Heat Pumps, Minimum Efficiency				
Warm Air Furnaces, Minimum Efficiency				
Boilers, Hot Water, Minimum Efficiency				
Boilers, Steam, Minimum Efficiency				
Condensing Units, Electrically Operated, Minimum Efficiency				
Water Chilling Package, Electrically Operated, Minimum Efficiency - Compliance Path (A or B)				
Water Chilling Package, Absorption, Minimum Efficiency - Compliance Path A				
Heat Rejection Equipment, Minimum Efficiency				
Plate-Type Liquid-to-Liquid Heat Exchanger				
Economizers				
Airside				
Waterside				
HVAC System Control				
Zone Thermostatic Control				
Independent Perimeter System Thermostatic Control				
Control Device for Each Humidification and/or Dehumidification System				
Heat Pump Supplementary Electric Resistance Heat Control				
Setpoint Deadband (Overlap Restriction)				
Automatic Off-Hour Setback and Shutdown Zone Control				
Automatic Start Control				
Automatic Zone Supply and Exhaust Damper Closure Control				
Economizer Cycle Controls				
Heat Rejection Equipment Fan Speed Control				
Ventilation System Controls				
Stair and Shaft Vent Motorized Damper Controls				
Ventilation Damper Controls				
Shutoff Damper Controls				
Motorized Damper Maximum Leakage Rate				
Demand Control Ventilation				
HVAC System Insulation and Sealing				
Insulation For Supply Duct, Minimum R-Value				
Insulation For Return Duct, Minimum R-Value				
Building Envelope and Duct Insulation Separating Duct or Plenum From Exterior, Minimum R-Value				
Duct Sealing				
Duct Testing Requirements				
Pipe Insulation for Heating Systems, Conductivity / Minimum Thickness				
Pipe Insulation for Cooling Systems, Conductivity / Minimum				
Pipe Insulation Protection				
Exhaust Air Energy Recovery System				
Percentage Outdoor Air at Full Design Supply Fan Airflow Rate				
Percentage Enthalpy Change Between Outdoor Air & Return Air				
Bypass or Control to Permit Economizer Operation				
Snow and Ice Melting System Control				
Maximum Allowable Fan Horsepower (Nameplate Horsepower Option or Break Horsepower Option)				
Variable Air Volume System Controls				
Variable Flow Control				
DDC Static Pressure Reset Control				
Supply Air Temperature Reset Control				

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
Air Reheating, Recooling and Mixing Limitations				
Hydronic System Controls				
Two Pipe Changeover Controls				
Variable Flow Controls				
Chiller Isolation Controls				
Boiler Isolation Controls				
Water Temperature Reset Controls				
Hydronic (Water Loop) Heat Pump and Water Cooled Unitary Air Conditioner System Controls				
Two Position Valve on Each Unit				
Automatic Isolation of Cooling Tower When Not Required				
Heat Recovery for Service Water Heating				
Cooling System Hot Gas Bypass Limitation: Maximum Percentage of Total				
Heating Outside Building				
Mechanical Systems Commissioning and Completion Requirements in Section C408.2				
Section C404				
Service Water Heating				
Water Heater Equipment, Minimum Performance				
Hot Water Supply Boiler Minimum Performance				
Pool Heater Minimum Performance				
Unfired Storage Tank Required Minimum Insulation R-Value				
Service Water Heater Equipment Temperature Control				
Service Water Heater Equipment Supply & Discharge Heat Traps				
Pipe Insulation for Service Hot-Water Systems, Conductivity / Thickness				
Circulating Service Hot Water System Pump Shut Off Control				
Pool and Spa Heater On-Off Switch				
Swimming Pool Heater and Pump Time Switch				
Pool Cover for Heated Pool				
Section C405				
Electrical Power and Lighting				
Gross Lighted Floor Area				
Interior Lighting Power	Allowance			
	Connected			
Equivalent Interior Lighting Power Density				
Percentage of Fixtures with High Efficacy Lamps in Dwelling Units				
Interior Lighting Controls				
Enclosed Area Lighting Controls				
Light Reduction Controls				
Automatic Building Shutoff Controls				
Occupancy Sensors in Required Areas (Manual On or Automatic On to 50% Power)				
Daylight Zone Controls				
Specific Application Controls				
Luminaire Tandem Wiring				
Exit Sign: Maximum Wattage per Face				
Exterior Lighting Zone (1, 2, 3, or 4)				
Exterior Lighting Power				
Total Exterior Lighting Power	Allowance			
	Connected			
Tradable Surface Exterior Lighting Power	Allowance			
	Connected			
Non-Tradable Surface Exterior Lighting Power	Allowance			
	Connected			
Exterior Lighting				
Automatic Exterior Lighting Control				
Minimum Lamp Efficacy				
Separately Metered Individual Dwelling Units				

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
<b>Section C406</b>				
<b>Additional Efficiency Package Options</b>				
Efficient HVAC Performance Option in Addition to Section C403 Requirements				
Unitary Air Conditioners, Electrically Operated, Minimum Efficiency				
Unitary and Applied Heat Pumps, Electrically Operated, Minimum <b>Cooling Mode</b> Efficiency				
Unitary and Applied Heat Pumps, Electrically Operated, Minimum <b>Heating Mode</b> Efficiency				
Package Terminal Air Conditioners (Cooling Mode,) Minimum Efficiency				
Package Terminal Heat Pumps (Cooling Mode,) Minimum Efficiency				
Warm Air Furnaces, Minimum Efficiency				
Boilers, Hot Water and Steam, Minimum Efficiency				
Water Chilling Package, Electrically Operated, Maximum Efficiency - Compliance Path (A or B)				
Water Chilling Package, Absorption, Minimum Efficiency - Compliance Path A				
Efficient Lighting System Option				
Equivalent Interior Lighting Power Density (Building Area Method)				
On-site Renewable Energy Option				
Total Minimum Ratings				
<b>Section C408</b>				
<b>System Commissioning</b>				
Mechanical Systems Commissioning and Completion Requirements				
Commissioning Plan				
Air System Balancing				
Hydronic System Balancing				
Functional Performance Testing				
Preliminary Commissioning Report				
Record Drawings				
Equipment Capacity Lists				
Operation Manuals				
Maintenance Manuals				
System Control Information				
System Narrative for Each System				
Systems Balancing Reports				
Final Commissioning Report				
Lighting Systems Commissioning and Completing Requirements				
Functional Testing of Automatic Controls				
Occupant Sensor Testing Procedures				
Time Switches Testing Procedures				
Programmable Schedule Control Testing Procedures				
Photosensors or Daylighting Control Testing Procedures				

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Total Building Performance, Annual Energy Cost	For Standard Reference Design Building			
Compliance is demonstrated when the proposed building's energy cost is equal to or less than 85 percent of the standard reference design building's energy cost.	For Proposed Design Building			
Section C402				
Building Envelope (Climate Zone 5A)				
Space-Conditioning Category (Nonresidential or Residential)				
Gross Roof Area				
Roofs: Maximum Assembly U-factor	Insulation Entirely Above Deck			
	Metal Building			
	Attic & Other			
Minimum Insulation R-Value	Insulation Entirely Above Deck			
	Metal Building			
	Attic & Other			
Walls: Above-Grade: Maximum Assembly U-factor	Mass			
	Metal Buildings			
	Metal Framed			
	Wood Framed & Other			
Above-Grade: Minimum Insulation R-Value	Mass			
	Metal Building			
	Metal Framed			
	Wood Framed & Other			
Below-Grade: Maximum Assembly C-factor				
Below-Grade: Minimum Insulation R-Value				
Floors: Maximum Assembly U-factor	Mass			
	Joist/Framing			
Minimum Insulation R-Value	Mass			
	Joist/Framing			
Slab-On-Grade, Maximum Assembly F-factor	Unheated Slab			
	Heated Slab			
Slab-On-Grade, Minimum Insulation R-Value	Unheated Slab			
	Heated Slab			
Opaque Doors:				
Maximum Assembly U-factor	Swinging			
Minimum Insulation R-Value	Roll-Up or Sliding			
Radiant Heating System Insulation				
Gross Wall Area				
Total Vertical Fenestration Area				
Vertical Glazing: Percent of Wall Area				
Increased Vertical Fenestration Area Requirements				
≥50% Conditioned Floor Area in Daylight Zone				
Automatic Daylighting Controls Installed				
Visible Transmittance of Vertical Fenestration >1.1 Times SHGC				
Vertical Glazing				
Maximum Assembly U-factor	Fixed Fenestration			
	Operable Fenestration			
	Entrance Door			
Maximum Assembly Solar Heat Gain Coefficient				
Increased Skylight Area with Automatic Daylighting Controls				
Required Minimum Skylight Fenestration Area with Daylighting Control				

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Space >10,000 sq. ft. & >15 ft. Ceiling Height and Used as Office, Lobby, Atrium, Concourse, Corridor, Storage, Gymnasium/Exercise Center, Convention Center, Automotive Service, Manufacturing, Non-Refrigerated Warehouse, Retail Store, Distribution Area, Sorting Area, Transportation or Workshop	Daylight Zone Under Skylight $\geq 50\%$ Floor Area Area/Daylight Zone $\geq 3\%$ or Effective Aperture $\geq 1\%$			
Total Skylight Area				
Skylight: Percent of Roof Area				
Skylight: Maximum Assembly U-factor				
Maximum Assembly Solar Heat Gain Coefficient				
Visible Transmittance (VT)				
Haze Factor				
Air Barriers:				
Construction				
Compliance Option	Materials			
	Assemblies			
	Building Testing			
Penetration Sealing				
Maximum Assembly Air Infiltration Rates	Windows			
	Sliding Doors			
	Swinging Doors			
	Skylights with Condensation Weepage Openings			
	Other Skylights			
	Curtain Walls			
	Storefront Glazing			
	Commercial Glazed Swinging Entrance Doors			
	Revolving Doors			
	Garage Doors			
	Rolling Doors			
Maximum Air Leakage Rates, Recessed Lighting Luminaires				
Damper, Maximum Leakage Rate				
Stairway and Shaft Vents				
Outdoor Air Intakes and Exhausts				
Loading Dock Weatherseal				
Vestibule				
Section C403				
Heating, Ventilating and Air Conditioning				
Calculated Load	Heating			
	Cooling			
Equipment Output Capacity	Heating			
	Cooling			
HVAC Equipment Performance				
Unitary Air Conditioners, Electrically Operated, Minimum Efficiency				
Air Cooled	Split System <65,000 Btu/h			
	Single Package <65,000 Btu/h			
Through-the-Wall, Air Cooled	Split System $\leq 30,000$ Btu/h			
	Single Package $\leq 30,000$ Btu/h			
Small-Duct High-Velocity, Air Cooled	Split System <65,000 Btu/h			

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Air Cooled with Electric Resistance Heating or None	≥65,000 Btu/h and <135,000 Btu/h			
	≥135,000 Btu/h and <240,000 Btu/h			
	≥240,000 Btu/h and <760,000 Btu/h			
	≥760,000 Btu/h			
Air Cooled with Other Than Electric Heating	≥65,000 Btu/h and <135,000 Btu/h			
	≥135,000 Btu/h and <240,000 Btu/h			
	and <760,000 Btu/h			
	≥760,000 Btu/h			
Water Cooled	<65,000 Btu/h			
Water Cooled with Electric Resistance Heating or None	≥65,000 Btu/h and <135,000 Btu/h			
	and <240,000 Btu/h			
	and <760,000 Btu/h			
	≥760,000 Btu/h			
Water Cooled with Other Than Electric Heating	≥65,000 Btu/h and <135,000 Btu/h			
	and <240,000 Btu/h			
	and <760,000 Btu/h			
	≥760,000 Btu/h			
Evaporatively Cooled	<65,000 Btu/h			
Evaporatively Cooled with Electric Resistance Heating or None	≥65,000 Btu/h and <135,000 Btu/h			
	≥135,000 Btu/h and <240,000 Btu/h			
	and <760,000 Btu/h			
	≥760,000 Btu/h			
Evaporatively Cooled with Other Than Electric Heating	≥65,000 Btu/h and <135,000 Btu/h			
	≥135,000 Btu/h and <240,000 Btu/h			
	and <760,000 Btu/h			
	≥760,000 Btu/h			
Condensing Units, Electrically Operated, Minimum Efficiency	Air Cooled ≥135,000 BTU/h			
	Water Cooled ≥135,000 Btu/h			
	Evaporatively Cooled ≥135,000 Btu/h			
Unitary and Applied Heat Pumps, Electrically Operated, Minimum Cooling Mode Efficiency	Air Cooled			
	Split System <65,000 Btu/h			
	Single Package <65,000 Btu/h			

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Through-the-Wall Air Cooled	Split System ≤30,000Btu/h			
	Single Package ≤30,000Btu/h			
Single-Duct High-Velocity Air Cooled	Split System <65,000 Btu/h			
	Air Cooled with Electric Resistance Heating or None	≥65,000 Btu/h and <135,000 Btu/h and <240,000 Btu/h		
Air Cooled with Other Than Electric Heating	Split System <65,000 Btu/h			
	Air Cooled with Other Than Electric Heating	≥65,000 Btu/h and <135,000 Btu/h and <240,000 Btu/h		
Water Source	<17,000 Btu/h			
	≥17,000 Btu/h and <65,000 Btu/h			
	≥65,000 Btu/h and <135,000 Btu/h			
Ground Water Source	(59° Entering Water)			
	(77° Entering Water)			
Water Source, Water-to-Water	(86° Entering Water)			
	(59° Entering Water)			
Ground Water Source, Brine-to-Water	(77° Entering Water)			
<b>Unitary and Applied Heat Pumps, Electrically Operated, Minimum Heating Mode Efficiency</b>				
Air Cooled	Split System <65,000 Btu/h			
	Single Package <65,000 Btu/h			
Through-the-Wall, Air Cooled	Split System (Cooling Capacity) ≤30,000Btu/h			
	Single Package (Cooling Capacity) ≤30,000Btu/h			
Small-Duct High-Velocity Air Cooled	Split System <65,000 Btu/h			
	Air Cooled (Cooling Capacity)	≥65,000 Btu/h and <135,000 Btu/h (47°F db/43°F wb Outdoor Air)		
Air Cooled	(Cooling Capacity)	≥65,000 Btu/h and <135,000 Btu/h (17°F db/15°F wb Outdoor Air)		
	(Cooling Capacity)	≥135,000 Btu/h (47°F db/43°F wb Outdoor Air)		
Air Cooled	(Cooling Capacity)	≥135,000 Btu/h (17°F db/15°F wb Outdoor Air)		
	(Cooling Capacity)	≥135,000 Btu/h (17°F db/15°F wb Outdoor Air)		
Water Source	(Cooling Capacity) <135,000 Btu/h			
Ground Water Source	(Cooling Capacity) <135,000 Btu/h			



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Ground Source	(Cooling Capacity) <135,000 Btu/h			
Water Source, Water-to-Water	(Cooling Capacity) <135,000 Btu/h (68°F Entering Water)			
	(Cooling Capacity) <135,000 Btu/h (50°F Entering Water)			
Ground Source, Brine-to-Water	(Cooling Capacity) <135,000 Btu/h			
Package Terminal Air Conditioners (Cooling Mode) Minimum Efficiency	New Construction			
	Replacements			
Package Terminal Heat Pumps (Cooling Mode) Minimum Efficiency	New Construction			
	Replacements			
Package Terminal Heat Pumps (Heating Mode) Minimum Efficiency	New Construction			
	Replacements			
Single Package Vertical Air Conditioners (Cooling Mode) Minimum Efficiency	<65,000 Btu/h ≥65,000 Btu/h and <135,000 Btu/h ≥135,000 Btu/h and <240,000			
Single Package Vertical Heat Pump (Cooling Mode) Minimum Efficiency	<65,000 Btu/h ≥65,000 Btu/h and <135,000 Btu/h ≥135,000 Btu/h and <240,000			
Single Package Vertical Heat Pump (Heating Mode) Minimum Efficiency	<65,000 Btu/h ≥65,000 Btu/h and <135,000 Btu/h ≥135,000 Btu/h and <240,000			
Room Air Conditioners with Louvered Sides Minimum Efficiency	<6,000 Btu/h ≥6,000 Btu/h and <8,000 Btu/h ≥8,000 Btu/h and <14,000 Btu/h ≥14,000 Btu/h and <20,000 Btu/h ≥20,000 Btu/h			
Room Air Conditioners without Louvered Sides, Minimum Efficiency	<8,000 Btu/h ≥8,000 Btu/h and <20,000 Btu/h ≥20,000 Btu/h			
Room Air Conditioner Heat Pumps with Louvered Sides, Minimum Efficiency	<20,000 Btu/h ≥20,000 Btu/h			
Room Air Conditioner Heat Pumps without Louvered Sides, Minimum Efficiency	<14,000 Btu/h ≥14,000 Btu/h			
Room Air Conditioner, Casement Only, Minimum Efficiency				
Room Air Conditioner, Casement-Slider, Minimum Efficiency				
Warm Air Furnaces, Minimum				
Gas Fired	<225,000 Btu/h ≥225,000 Btu/h			
Oil Fired	<225,000 Btu/h ≥225,000 Btu/h			
Warm Air Duct Furnaces, Gas Fired, Minimum Efficiency				
Warm Air Unit Heaters, Gas Fired, Minimum Efficiency				
Warm Air Unit Heaters, Oil Fired, Minimum Efficiency				
Boilers, Hot Water, Minimum Efficiency				
Gas Fired	<300,000 Btu/h and ≤2,500,000 Btu/h >2,500,000 Btu/h			
Oil Fired	<300,000 Btu/h and <2,500,000 Btu/h			

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	>2,500,000 Btu/h			
<b>Boilers, Steam, Minimum Efficiency</b>				
Gas Fired	<300,000 Btu/h			
Gas Fired, Except Natural Draft	and ≤2,500,000 Btu/h			
	>2,500,000 Btu/h			
Natural Draft Gas Fired	and ≤2,500,000 Btu/h			
	>2,500,000 Btu/h			
Oil Fired	<300,000 Btu/h			
	and ≤2,500,000 Btu/h			
	>2,500,000 Btu/h			
<b>Condensing Units, Electrically Operated, Minimum Efficiency</b>				
Air Cooled	≥135,000 Btu/h			
Water or Evaporatively Cooled	≥135,000 Btu/h			
<b>Water Chilling Package, Electrically Operated, Minimum Efficiency</b>				
Air Cooled (Compliance Path A)	<150 tons			
	≥150 tons			
Air Cooled without Condenser				
Water Cooled Reciprocating				
Water Cooled Positive Displacement	<75 tons			
	≥75 tons and <150 tons			
	≥150 tons and <300 tons			
	≥300 tons			
Water Cooled Centrifugal	<150 tons			
	≥150 tons and <300 tons			
	≥300 tons and <600 tons			
	≥600 tons			
<b>Water Chilling Package, Absorption, Minimum Efficiency - Compliance Path A</b>				
	Air Cooled, Single Effect			
	Water Cooled, Single Effect			
	Double Effect, Indirect Fired			
	Double Effect, Direct Fired			
<b>Heat Rejection Equipment, Minimum Performance</b>				
	Propeller or Axial Fan Open Circuit Cooling Towers			
	Centrifugal Fan Open Circuit Cooling Towers			
	Propeller or Axial Fan Closed Circuit Cooling Towers			
	Centrifugal Fan Closed Circuit Cooling Towers			
	Air Cooled Condensers			
<b>Plate Type Liquid-to-Liquid Heat Exchangers</b>				
<b>Economizers</b>				
Airside (with Relief of Excess Outdoor Air), Capacity				
Waterside (Designed with Maximum Pressure Drop), Capacity				
<b>HVAC System Control</b>				
Zone Thermostatic Control				
Independent Perimeter System Thermostatic Control				
Control Device for Each Humidification and/or Dehumidification System				
Heat Pump Supplementary Electric Resistance Heat Control				
Setpoint Deadband (Overlap Restriction)				

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Automatic Off-Hour Setback and Shutdown Zone Control	Operating Range			
	Different Daily Schedules			
	Maintenance During Power Failure			
	Manual Override			
Automatic Start Control				
Automatic Zone Supply and Exhaust Damper Closure Control				
Economizer Cycle Controls	Allowed Types			
	Integrated with Equipment High-Limit Airside Shutoff			
Heat Rejection Equipment Fan Speed Control				
Ventilation System Controls				
Stair and Shaft Vent Motorized Damper Controls				
Ventilation Damper Controls				
Shutoff Damper Controls				
Motorized Damper Maximum Leakage Rate				
Demand Control Ventilation				
HVAC System Insulation and Sealing				
Insulation For Supply Duct, R-Value				
Insulation For Return Duct, R-Value				
Building Envelope and Duct Insulation Separating Duct or Plenum From Exterior, Minimum R-Value				
Duct Sealing				
Duct Testing Requirements				
Pipe Insulation for Heating and Cooling Systems, Conductivity / Minimum Thickness	Fluid Operating Temperature (°F) / Nominal Pipe Size			
	>350° / <1"			
	>350° / 1" to <1½"			
	>350° / 1½" to <4"			
	>350° / 4" to <8"			
	>350° / ≥8"			
	251° - 350° / <1"			
	251° - 350° / 1" to <1½"			
	251° - 350° / 1½" to <4"			
	251° - 350° / 4" to <8"			
	251° - 350° / ≥8"			
	201° - 250° / <1"			
	201° - 250° / 1" to <1½"			
	201° - 250° / 1½" to <4"			
	201° - 250° / 4" to <8"			
	201° - 250° / ≥8"			
	141° - 200° / <1"			
	141° - 200° / 1" to <1½"			
	141° - 200° / 1½" to <4"			
	141° - 200° / 4" to <8"			
	141° - 200° / ≥8"			
	105° - 140° / <1"			
	105° - 140° / 1" to <1½"			
	105° - 140° / 1½" to <4"			
	105° - 140° / 4" to <8"			
	105° - 140° / ≥8"			
40° - 60° / <1"				
40° - 60° / 1" to <1½"				
40° - 60° / 1½" to <4"				
40° - 60° / 4" to <8"				
40° - 60° / ≥8"				
<40° / <1"				
<40° / 1" to <1½"				
<40° / 1½" to <4"				
<40° / 4" to <8"				
<40° / ≥8"				
Pipe Insulation Protection				

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<b>Exhaust Air Energy Recovery System</b>				
Percentage Outdoor Air at Full Design Supply Fan Airflow Rate	≥30% and <40% @ ≥5,500 cfm			
	≥40% and <50% @ ≥4,500 cfm			
	≥50% and <60% @ ≥3,500 cfm			
	≥60% and <70% @ ≥2,000 cfm			
	≥70% and <80% @ ≥1,000 cfm			
	≥80% @ >0 cfm			
Percentage Enthalpy Change Between Outdoor Air & Return Air Bypass or Control to Permit Economizer Operation				
<b>Snow and Ice Melting System Control</b>				
	Automatic Control Based on Pavement Temperature & Precipitation			
	Control Based on Outdoor Temperature			
<b>Maximum Allowable Fan Horsepower (Nameplate Horsepower Option or Break Horsepower Option)</b>				
	Constant Volume			
	Variable Volume			
<b>Variable Air Volume System Controls</b>				
Variable Flow Control				
DDC Static Pressure Reset Control				
Supply Air Temperature Reset Control				
Air Reheating, Recooling and Mixing Limitations				
<b>Hydronic System Controls</b>				
Two Pipe Changeover Controls with Deadband				
Variable Flow Controls				
Chiller Isolation Controls				
Boiler Isolation Controls				
Water Temperature Reset Controls				
<b>Hydronic (Water Loop) Heat Pump System Controls</b>				
Two Position Valve on Each Heat Pump				
Deadband between Addition or Rejection of Heat				
Automatic Isolation of Cooling Tower When Not Required				
<b>Heat Recovery for Service Water Heating</b>				
<b>Cooling System Hot Gas Bypass Limitation: Maximum Percentage of Total Heating Outside Building</b>				
Radiant System				
Occupant Sensing Device or Timer Switch Control				
<b>Mechanical Systems Commissioning and Completion Requirements in Section C4</b>				
<b>Section C404</b>				
<b>Service Water Heating</b>				
<b>Water Heating Equipment, Minimum Performance</b>				
Electric Resistance	≤12 kW			
	>12 kW			
Electric Heat Pump	≤24 amps and ≤250 volts			
Storage, Gas	≤75,000 Btu/h & ≥20 gal			
	>75,000 Btu/h and ≤155,000 Btu/h & <4,000 Btu/h/gal			
	>155,000 Btu/h & <4,000 Btu/h/gal			
Instantaneous, Gas	>50,000 and <200,000 Btu/h & ≥4,000 Btu/h/gal and <2 gal			

Building Energy Performance Characteristics  
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Project:

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
	≥200,000 Btu/h & ≥4,000 Btu/h/gal and <10 gal			
	≥200,000 Btu/h & ≥4,000 Btu/h/gal and ≥10 gal			
Storage, Oil	≤105,000 Btu/h & ≥20 gal			
	>105,000 Btu/h & <4,000 Btu/h/gal			
Instantaneous, Oil	≤210,000 Btu/h & ≥4,000 Btu/h/gal and <2 gal			
	>210,000 Btu/h & ≥4,000 Btu/h/gal and <10 gal			
	>210,000 Btu/h & ≥4,000 Btu/h/gal and ≥10 gal			
Hot Water Supply Boiler, Minimum Performance				
Gas and Oil	and <12,500,000 Btu/h & ≥4,000 Btu/h/gal and <10 gal			
Gas	and <12,500,000 Btu/h & ≥4,000 Btu/h/gal and ≥10 gal			
Oil	and <12,500,000 Btu/h & >4,000 Btu/h/gal and >10 gal			
Pool Heater, Minimum Performance				
Gas and Oil				
Heat Pump				
Unfired Storage Tank, Minimum Insulation R-Value				
Service Water Heater Equipment Temperature Control				
Service Water Heater Supply & Discharge Heat Traps				
Pipe Insulation for Service Hot-Water Systems, Conductivity / Thickness	Circulating and Heat-Traced Systems			
	Non Temperature Maintenance Systems			
Circulating Service Hot Water System Pump Shut Off Control				
Pool and Spa Heater Accessible On-Off Switch				
Swimming Pool Heater and Pump Time Switch				
Pool Cover for Heated Pool and Inground Spas				
Section C405				
Electrical Power and Lighting				
Building Type				
Gross Lighted Floor Area				
Interior Lighting Power	Allowance			
	Connected			
Equivalent Interior Lighting Power Density (by Building Area Method or Space-by-Space Method)				
Percentage of Fixtures with High Efficacy Lamps in Dwelling Units				
Interior Lighting Controls				
Enclosed Area Lighting Controls				
Light Reduction Controls				
Automatic Building Time Switch Controls				
Occupancy Sensors in Required Areas (Manual On or Automatic On to	Classrooms			

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
50% Power)	Conference/Meeting Rooms			
	Employee Lunch & Break Rooms			
	Private Offices			
	Restrooms			
	Storage Rooms			
	Janitorial Closets			
	Spaces ≤300 sq. Ft. enclosed by Floor-to-Ceiling Height Partitions			
Daylight Zone Controls	Manual Controls			
	Controls			
	Multi-Level Controls			
Specific Application Controls	Display & Accent Light			
	Case Lighting			
	Hotel & Motel Sleeping Unit & Guest Suites			
	Supplemental Task Lighting			
	Lighting for Nonvisual Applications			
	Lighting Equipment for Sale or Demonstration			
Luminaire Tandem Wiring				
Exit Sign: Maximum Wattage per Face				
Exterior Lighting Zone (1, 2, 3, or 4)				
Exterior Lighting Power				
Total Exterior Lighting Power	Allowance			
	Connected			
Tradable Surface Exterior Lighting Power Allowance	Allowance			
	Connected			
Non-Tradable Surface Exterior Lighting Power Allowance	Allowance			
	Connected			
Exterior Lighting				
Automatic Exterior Lighting Control	Dusk-to-Dawn Operation			
	Not Dusk-to-Dawn Operation			
Minimum Lamp Efficacy				
Separately Metered Individual Dwelling Units				
Section C406				
Additional Efficiency Package Options				
Efficient HVAC Performance Option in Addition to Section C403 Requirements				
Unitary Air Conditioners, Electrically Operated, Minimum Efficiency				
Air Cooled	Split System <65,000 Btu/h			
	Single Package <65,000 Btu/h			
	≥65,000 Btu/h and <240,000 Btu/h			
	and <760,000 Btu/h			
	≥760,000 Btu/h			
Water and Evaporatively Cooled				

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
<b>Unitary and Applied Heat Pumps, Electrically Operated, Minimum Cooling Mode Efficiency</b>				
Air Cooled	Split System <65,000 Btu/h			
	Single Package <65,000 Btu/h			
	≥65,000 Btu/h and <240,000 Btu/h			
	≥240,000 Btu/h			
Water Source	<135,000 Btu/h			
<b>Unitary and Applied Heat Pumps, Electrically Operated, Minimum Heating Mode Efficiency</b>				
Air Cooled	Split System (Cooling Capacity) <65,000 Btu/h			
	Single Package (Cooling Capacity) <65,000 Btu/h			
	(Cooling Capacity) ≥65,000 Btu/h and <135,000 Btu/h (47°F db/43°F wb Outdoor Air)			
	(Cooling Capacity) ≥65,000 Btu/h and <135,000 Btu/h (17°F db/15°F wb Outdoor Air)			
	(Cooling Capacity) ≥135,000 Btu/h (47°F db/43°F wb Outdoor Air)			
	(Cooling Capacity) ≥135,000 Btu/h (17°F db/15°F wb Outdoor Air)			
Water Source	(Cooling Capacity) <135,000 Btu/h			
<b>Package Terminal Air Conditioners and Package Terminal Heat Pumps (Cooling Mode), Minimum Efficiency</b>				
	<7,000 Btu/h			
	≥7,000 Btu/h and <10,000 Btu/h			
	≥10,000 Btu/h and ≤13,000 Btu/h			
	>13,000 Btu/h			
<b>Warm Air Furnaces, Minimum Efficiency</b>				
Gas Fired	<225,000 Btu/h			
	≥225,000 Btu/h			
Oil Fired	<225,000 Btu/h			
	≥225,000 Btu/h			
<b>Warm Air Duct Furnaces, Gas Fired, Minimum Efficiency</b>				
<b>Warm Air Unit Heaters, Gas Fired, Minimum Efficiency</b>				
<b>Warm Air Unit Heaters, Oil Fired, Minimum Efficiency</b>				
<b>Boilers, Hot Water, Minimum Efficiency</b>				
Gas Fired	<300,000 Btu/h and ≤2,500,000 Btu/h			
	>2,500,000 Btu/h			
Oil Fired	<300,000 Btu/h and ≤2,500,000 Btu/h			
	>2,500,000 Btu/h			
<b>Boilers, Steam, Minimum Efficiency</b>				
Gas Fired	<300,000 Btu/h and ≤2,500,000 Btu/h			
	>2,500,000 Btu/h			

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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design	
Oil Fired	<300,000 Btu/h				
	and ≤2,500,000 Btu/h				
	>2,500,000 Btu/h				
	Water Chilling Package, Electrically Operated, Minimum Efficiency - Compliance Path (A or B)				
	Air Cooled	<150 tons			
		≥150 tons			
	Air Cooled without Condenser				
	Water Cooled Reciprocating				
	Water Cooled Positive Displacement	<75 tons			
		≥75 tons and <150 tons			
		≥150 tons and <300 tons			
		≥300 tons			
	Water Cooled Centrifugal	<150 tons			
		≥150 tons and <300 tons			
		≥300 tons and <600 tons			
≥600 tons					
Water Chilling Package, Absorption, Minimum Efficiency - Compliance Path A					
	Air Cooled, Single Effect (Heat Recovery Application)				
	Water Cooled, Single Effect (Heat Recovery Application)				
	Double Effect, Indirect Fired				
	Double Effect, Direct Fired				
Efficient Lighting System Option					
Equivalent Interior Lighting Power Density (Building Area Method)					
On-site Renewable Energy Option					
Total Minimum Rating (One of)					
	Capacity				
	Use				
Section C408					
System Commissioning					
Mechanical Systems Commissioning and Completion Requirements					
Commissioning Plan					
	Narrative Description of Activities				
	Listing of Equipment, Appliances or Systems To Be Tested				
	Functions To Be Tested				
	Test Conditions				
	Measurable Criteria for Performance				
Air System Balancing					
Hydronic System Balancing					
Functional Performance Testing					
	Equipment in All Modes of Operation				



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	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values In Simulation for Proposed Building Design	Values Incorporated Into This Design
	Equipment in Redundant or Automatic Back-up Mode			
	Equipment Performance			
	Upon Loss and Restoration of Power			
	Controls			
	Economizers			
Preliminary Commissioning Report	Provided to Owner			
	Acceptance of Report by Owner			
	Availability for Review			
Documentation Requirements				
	Record Drawings			
	Equipment Capacity Lists			
	Operation Manuals			
	Maintenance Manuals			
	System Control Information			
	System Narrative for Each			
	Systems Balancing Reports			
	Final Commissioning Report			
Lighting Systems Commissioning and Completion Requirements				
	Functional Testing of Automatic Controls			
	Occupant Sensor Testing Procedures			
	Time Switches Testing Procedures			
	Programmable Schedule Control Testing Procedures			
	Photosensors or Daylighting Control Testing Procedures			