2012 IECC

(International Energy Conservation Code)

Compliance Documentation

Career Development Seminar

State of Connecticut

Office of Education and Data Management

June 2015

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Responsibilities

- Designer / Design Profession
  - Develop construction documents that comply
  - Provide compliance documentation
- Building Official
  - Verify compliance of construction documents
  - Inspect as built conditions for compliance
- Contractors
  - Complete project that functions as intended and is in compliance with the energy code

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Why Compliance Documentation?

- Code requirements
- Facilitates permit review
- Communicates code compliance and project requirements to:
  - Building officials
  - Contractors and sub contractors
  - Suppliers

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Sections R103 & C103

Information on construction documents

- Insulation materials and their R-values
- Fenestration U-factors and SHGCs
- Area-weighted U-factor and SHGC calculations
- Mechanical system design criteria
- Mechanical and service water heating system and equipment types, sizes and efficiencies
- Economizer description
- Equipment and systems controls
- Fan motor horsepower (hp) and controls
- Duct sealing
- Duct and pipe insulation and location
- Lighting fixture schedules with wattage and control narrative
- Air seal details

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Compliance Documentation

For Residential Projects

- Identify the code to be complied with
- Approaches
  - Project requirements scattered throughout the plans
  - REScheck
  - Forms from codes/standards organization
  - Forms as developed by designer or design professional

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Sample Residential Project

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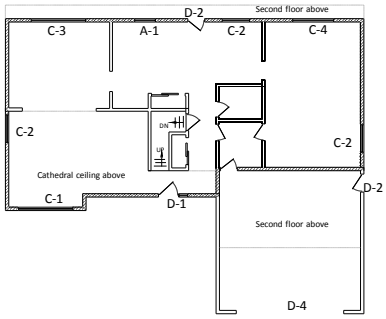
Sample Residential Project

First Floor Plan



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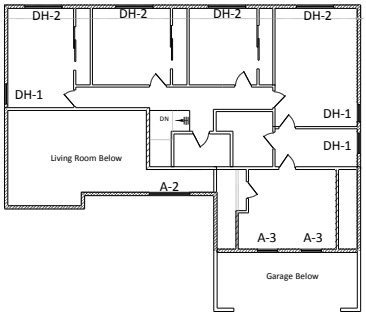
Sample Residential Project

Second Floor Plan



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Sample Residential Project

Schedules

Window Schedule

ID	Type	Style	RO Width	RO Height	U-Factor	SHGC	Infiltration Rate
C-1	Casement (LSSR)	400 Series	8.083	5.000	0.28	0.32	0.1
C-2	Casement (LR)	400 Series	4.083	4.083	0.28	0.32	0.1
C-3	Casement (LSR)	400 Series	8.083	4.083	0.28	0.32	0.1
C-4	Awning	400 Series	6.000	4.083	0.28	0.31	0.1
A-1	Awning	400 Series	3.083	3.500	0.28	0.31	0.1
A-2	Twin Awning	400 Series	6.083	2.083	0.28	0.31	0.1
A-3	Awning	400 Series	3.042	2.083	0.28	0.31	0.1
DH-1	Double Hung	400 Series	2.500	4.083	0.29	0.33	0.1
DH-2	Twin Double Hung	400 Series	5.667	4.083	0.29	0.33	0.1

Certification label to remain on windows until inspection and approval by the building official

2012 IECCCode Requirements 0.32 NR ≤0.3


National Fenestration Rating Council

Name and Logo of IA

AAA Window Company

Energy Rating Factors	Ratings		Product Description
U-Factor	0.48	0.38	Model 1000 Casement Low-e #2 0.5" pp Argon filled
Solar Heat Gain Coefficient	0.65	0.66	
Visible Light Transmittance	0.71	0.71	
Air Leakage	0.2	0.2	

Door Schedule

ID	Type	Style	Width	Height	U-Factor	SHGC	Infiltration Rate
D-1	Opaque Entry with 15" Sidelight	Performance Grade	4.250	6.667	0.32	0.19	0.3
D-2	Entry with Window	Performance Grade	2.667	6.667	0.27	0.22	0.3
D-3	Opaque Entry	Performance Grade	2.500	6.667	0.21	-	0.3
D-4	Overhead Garage	Performance Grade	16.000	7.000			

Certification label to remain on doors until inspection and approval by the building official

2012 IECC Code Requirements 0.32 NR ≤0.5

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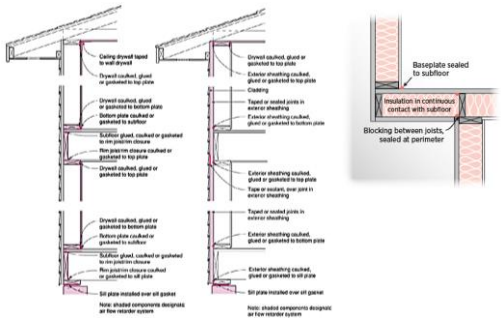
Code Requirement

Air Sealing(Mandatory)



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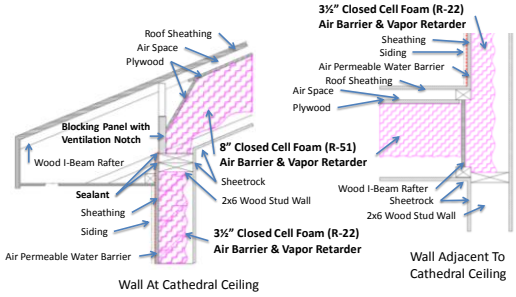
Sample Residential Project

Wall and Roof/Ceiling Sections



Wall At Cathedral Ceiling

Wall Adjacent To Cathedral Ceiling

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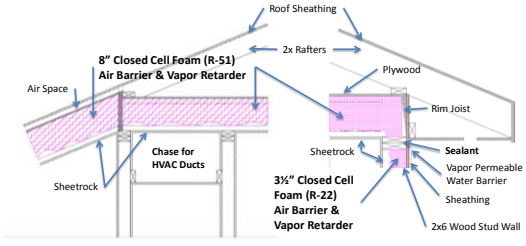
Sample Residential Project

Wall and Roof/Ceiling Sections



Second Floor Ceiling

Cathedral & Second Floor Ceiling

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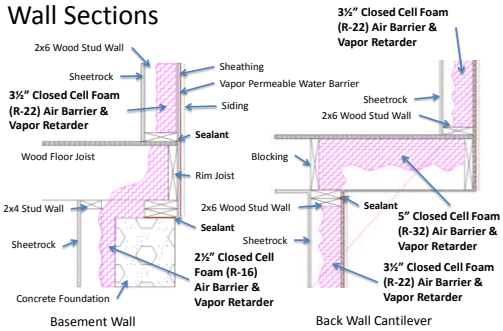
Sample Residential Project

Wall Sections



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Sample Residential Project

General Envelope Notes

- Fenestration rating certificates are to be left on the product until the leakage test is performed.
- Thermal envelope to be leakage tested after all utility penetrations have been completed and the air barrier and insulation have been installed.
- Verified air leakage rate shall be equal to or less than 3 air changes per hour. Leaks shall be sealed and test shall be repeated until this leakage rate is achieved.

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Sample Residential Project

Heating and Cooling System Notes

- Heat loss and heat gain calculations to be provided.
- All ducts and piping to be inside the thermal envelope.
- Programmable thermostat to be provide for each zone.
- All ducts and air handlers are to be sealed.
- All piping to have R-3 insulation.
- Fully ducted energy recovery system with minimum 2.8cfm/watt efficiency to be provided.

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Sample Residential Project

Other System Notes

- Plumbing system
  - Automatic circulating hot water system to be provided.
  - All hot water piping to have R-3 insulation.
- Lighting system
  - CFL or LED lamps to be installed in all fixtures

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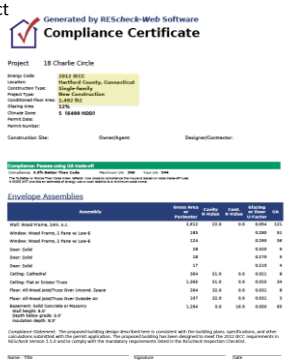
Sample Residential Project

REScheck

Wall: Wood Frame, 24In. o.c.
Window: Wood Frame, 2 Pane w/ Low-E
Window: Wood Frame, 2 Pane w/ Low-E
Door: Solid
Door: Solid
Door: Solid
Ceiling: Cathedral
Ceiling: Flat or Scissor Truss
Floor: All-Wood joist/Truss Over Uncond. Space
Floor: All-Wood joist/Truss Over Outside Air
Basement: Solid Concrete or Masonry
Wall height: 8.0'
Depth below grade: 5.0'
Insulation depth: 8.0'


Generated by REScheck-Web Software
Compliance Certificate

Project 18 Charlie Circle

Envelope Assemblies

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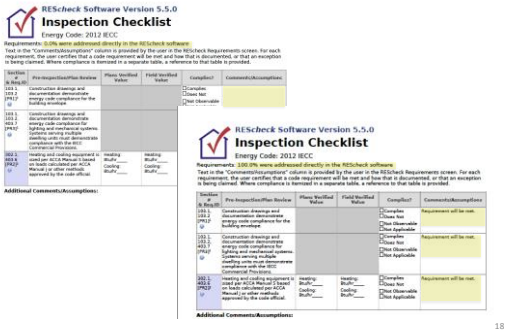
Sample Residential Project

REScheck


REScheck Software Version 5.5.0
Inspection Checklist
Energy Code: 2012 IECC

REScheck Software Version 5.5.0
Inspection Checklist
Energy Code: 2012 IECC

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Sample Residential Project

Heating and Cooling Load Calculations

Heating Load (≤72° Design)

- Conductive heat losses
  (U × A × ΔT)
- Infiltration heat losses
  [1.1 × (ACH/60) × vol × ΔT]
- Ventilation heat losses
  [1.1 × Vent Rate × ΔT × (1- eff)]

Design outdoor air temperature (ASHRAE 90.1-2013)

	99.6%	1% db	1% wb
Bridgeport	8°	84°	72°
Hartford	2°	88°	72°

Cooling Load (≥75° Design)

- Conductive heat gains
- Radiation heat gains
- Infiltration heat gains
- Infiltration humidity gains
- Ventilation heat gains
- People heat loads
- People humidity loads
- Equipment loads
- Cooking loads

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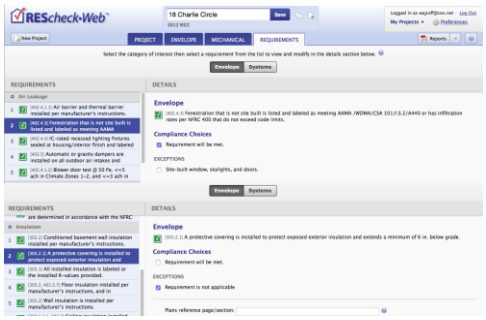
Sample Residential Project

REScheck



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Sample Residential Project

REScheck

Section # & Req.ID	Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
402.1.1 [FO4][1]	Conditioned basement wall insulation R-value. Where interior insulation is used, verification may need to occur during Insulation Inspection. Not required in warm-humid locations in Climate Zone 3.	R-____ R-____	R-____ R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
303.2 [FO5][1]	Conditioned basement wall insulation installed per manufacturer's instructions.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
402.2.8 [FO6][1]	Conditioned basement wall insulation depth of burial or distance from top of wall.	____ ft	____ ft	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
303.2.1 [FO11][F]	A protective covering is installed to protect exposed exterior insulation and extends a minimum of 6 in. below grade.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement is not applicable.
403.8 [FO12][F]	Snow- and ice-melting system controls installed.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement is not applicable.

Additional Comments/Assumptions:

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Sample Residential Project

REScheck

Section # & Req.ID	Framing / Rough-in Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
402.1.1, 402.3.4 [FR13]F	Door U-factor.	U-____	U-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	See the Envelope Assemblies table for values.
402.1.1, 402.3.1, 402.3.3, 402.3.6, 402.5 [FR29]F	Glazing U-factor (area-weighted average).	U-____	U-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	See the Envelope Assemblies table for values.
303.1.3 [FR4]F	U-factors of fenestration products are determined in accordance with the NFRC test procedure or taken from the default table.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
402.4.1.1 [FR23]F	Air barrier and thermal barrier installed per manufacturer's instructions.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
402.1.1, 402.2.6 [IN1]F	Floor insulation R-value.	R-____ ☐ Wood ☐ Steel	R-____ ☐ Wood ☐ Steel	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	See the Envelope Assemblies table for values.
303.2, 402.2.7 [IN2]F	Floor insulation installed per manufacturer's instructions, and in substantial contact with the underside of the subfloor.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
402.1.1, 402.2.5, 402.2.6 [IN3]F	Wall insulation R-value. If this is a mass wall with at least ½ of the wall insulation on the wall exterior, the exterior insulation requirement applies (FR10).	R-____ ☐ Wood ☐ Mass ☐ Steel	R-____ ☐ Wood ☐ Mass ☐ Steel	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	See the Envelope Assemblies table for values.

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Sample Residential Project

REScheck

403.2.1 [FR12]F	Supply ducts in attics are insulated to ≥R-8. All other ducts in unconditioned spaces or outside the building envelope are insulated to ≥R-6.	R-____ R-____	R-____ R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Ducts located completely inside the building envelope.
403.2.2 [FR13]F	All joints and seams of air ducts, air handlers, and filter boxes are sealed.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
403.2.3 [FR15]F	Building cavities are not used as ducts or plenums.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
403.3 [FR17]F	HVAC piping conveying fluids above 105 ºF or chilled fluids below 55 ºF are insulated to ≥R-3.	R-____	R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
403.3.1 [FR24]F	Protection of insulation on HVAC piping.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
403.4.2 [FR18]F	Hot water pipes are insulated to ≥R-3.	R-____	R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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Sample Residential Project

REScheck

402.2.4 [FI3]F	Attic access hatch and door insulation ≥R-value of the adjacent assembly.	R-____	R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
402.4.1.2 [FI17]F	Blower door test @ 50 Pa. <=5 ach in Climate Zones 1-2, and <=3 ach in Climate Zones 3-8.	ACH 50 =____	ACH 50 =____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
403.2.2 [FI4]F	Duct tightness test result of <=4 cfm/100 ft2 across the system or <=3 cfm/100 ft2 without air handler @ 25 Pa. For rough-in tests, verification may need to occur during Framing Inspection.	____ cfm/100 ft²	____ cfm/100 ft²	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** All ducts and air handlers are located within conditioned space.
403.2.2.1 [FI24]F	Air handler leakage designated by manufacturer at <=2% of design air flow.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement is not applicable.

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Sample Residential Project

REScheck

2012 IECC Energy Efficiency Certificate

Insulation Rating	R-Value
Above-Grade Wall	22.00
Below-Grade Wall	16.00
Floor	32.00
Ceiling / Roof	51.00
Ductwork (unconditioned spaces):	____

Glass & Door Rating	U-Factor	SHGC
Window	0.28	
Door	0.32	

Heating & Cooling Equipment	Efficiency
Heating System:_____	____
Cooling System:_____	____
Water Heater:_____	____

Name: _____ Date:_____

Comments

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Compliance Documentation

For Commercial Projects

- Identify the code to be complied with
- Approaches
  - Project requirements scattered throughout the construction documents
  - COMcheck
  - AIA Connecticut sample documentation
  - Forms from codes/standards organization
  - Forms from US Department of Energy
  - Forms as developed by designer or design professional

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Compliance Requirement

For Commercial Projects

- C401.2 Application: comply with ONE of:
  1. ANSI/ASHRAE/IESNA Standard 90.1-2010
  2. Sections C402 (Envelope), C403 (Mechanical Systems), C404 (Service Water Heating), C405 (Electrical Power and Lighting Systems) **AND WITH** either Section 406.2 (Efficient HVAC Performance), 406.3 (Efficient Lighting System) or C406.4 (On-site Renewable Energy)
  3. Section C407 (Total Building Performance) and all mandatory requirements. Building energy cost shall be ≤85% of standard reference design building.
- C401.2.1 Application to existing building

  Additions, alterations and repairs shall comply with ONE of:
  - Sections C402, C403, C404 and C405, or
  - ANSI/ASHRAE/IESNA Standard 90.1-2010

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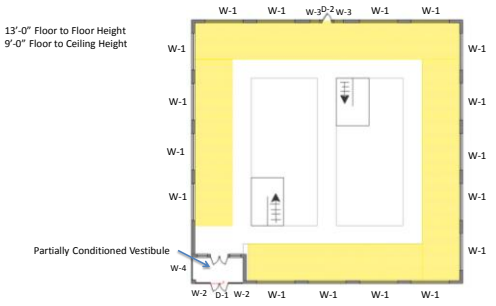
Sample Commercial Project

First Floor Plan



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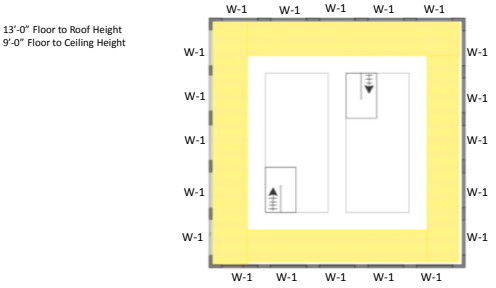
Sample Commercial Project

Second Floor Plan



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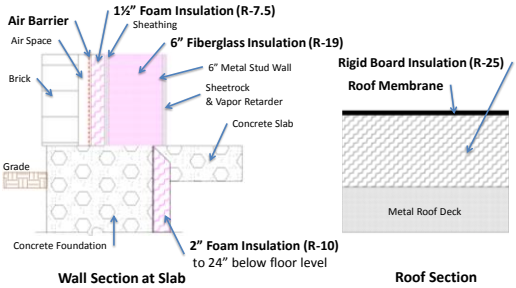
Sample Commercial Project

Sections



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Sample Commercial Project

Envelope Notes/Details

Window Schedule

ID	Description	Width	Height	U-Factor	SHGC	Air Leakage Rate (cfm/sf)
W-1	Metal frame with fixed double pane glass and thermal break	14'-0"	5'-6"	0.38	0.40	0.20
W-2	Metal frame with fixed double pane glass and thermal break	3'-9"	8'-0"	0.38	0.40	0.20
W-3	Metal frame with fixed double pane glass and thermal break	3'-6"	5'-6"	0.38	0.40	0.20
W-4	Metal frame with fixed double pane glass and thermal break	9'-0"	8'-0"	0.38	0.40	0.20

Door Schedule

ID	Description	Width	Height	U-Factor	SHGC	Air Leakage Rate (cfm/sf)
D-1	Double commercial glazed swinging entrance door	6'-6"	8'-0"	0.77	0.40	1.00
D-2	Insulated metal door	3'-6"	8'-0"	0.37	-	0.20

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Sample Commercial Project

Envelope Notes/Details

- Air barrier shall be continuous over all surfaces.
- Air barrier sealing details for penetrations and fenestration shall be followed.
- Doors in vestibule shall be equipped with self-closing devices

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Sample Commercial Project

Mechanical Schedules/Notes

Rooftop Unit Schedule (Natural Gas Heat)

		Supply Fan				Cooling Coil			Heating Section				Efficiencies		
ID	Nominal Capacity (tons)	CFM	Min. HP (Belt)	E.S.P.	Speed Control	TH (MBH)	SH (MBH)	EAT (DB/WB)	Min Input (MBH)	Min. Output (MBH)	Min. No. Stages	Outdoor Air (CFM)	Cooling (EER)	Cooling (IEER)	Heating Steady State (%)
RTU-1	20	8,000	5	0.75	VSD	258.9	197.3	80/67	400	324	2	2,000	10.0	12.3	81.0
RTU-2	20	8,000	5	0.75	VSD	258.9	197.3	80/67	400	324	2	2,000	10.0	12.3	81.0

Notes
1 Units shall be furnished with comparative enthalpy economizer with barometric relief.
2 Units shall be furnished with 14" high insulated (R-8) roof curb.
3 Units shall be controlled by the building automation system
4 Outdoor air supply and exhaust openings shall be furnished with motorized dampers with a maximum leakage rate of 4 cfm/sf at 1.0" water gauge.

Boiler Schedule

ID	Description	Max Input (MBH)	AHRI Rating (MBH)	Thermal Efficiency
B-1	Direct Vent Condensing Boiler	500	409	94.00%

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Sample Commercial Project

Mechanical Notes/Details

- Heat loss and cooling load calculations are provided.
- Building automation system shall control HVAC system functions and schedule.
- HVAC shall be low-pressure variable-air-volume system with parallel fan powered boxes with hot water coils.
- Perimeter hot water baseboard shall be provided as shown on drawings.

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Sample Commercial Project

Mechanical Notes/Details

- Ducts, air handlers and filter boxes shall be sealed.
- 2" of insulation with conductivity of 0.27 shall be installed on all heating pipes.
- Air systems and hydronic systems shall be adjusted and balanced.

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Sample Commercial Project

Mechanical Notes/Details

- Commissioning plan for the mechanical system shall be followed.
- Preliminary commissioning report shall be given to owner's representative before final inspection by the building official.
- As built drawings including performance data shall be provided.
- Operations manuals and maintenance manuals shall be provided.

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Sample Commercial Project

Service Water Schedules/Notes

Water Heaters				
ID	Description	Heating Capacity (gpm)	Temp Rise (°F)	Thermal Efficiency
WH-1	Tankless Electric	0.32	50	98%

- ½" insulation with a conductivity of 0.27 shall be installed on hot water pipes between instantaneous water heater and faucet.

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Sample Commercial Project

Interior Lighting Schedules/Notes/Details

Lighting Fixtures Schedule
This office building project is designed to 2012 IECC with efficient lighting system efficiency package option (0.85 watts per square foot)

ID	Description	Lamp			Ballast		Input
		No	Type	Series	Type	Ballast Factor	
1	2x4 Recessed Indirect Troffer	2	F32T8 HP	800	Premium Electronic, Program Start	0.88	56
2a	2x2 Recessed Indirect Troffer	2	F17T8 HP	800	Premium Electronic, Instant Start	0.88	30
2b	2x2 Recessed Indirect Troffer	2	F17T8 HP	800	Premium Electronic, Instant Start	0.88	30
3	6" Downlight	1	LED 16w				16
4	1x4 Wall Mount	1	F32T8 HP	800	Premium Electronic, Rapid Start	0.88	28

- Luminaires in conference/meeting rooms, lunch/break rooms private offices, restrooms and storage rooms shall be controlled by occupancy sensors.
- Controls in all other spaces, except corridors, shall allow for manual reduction of lighting load by at least 50 percent.
- Task lighting shall have automatic occupancy sensor controls.

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Sample Commercial Project

Exterior Lighting Schedules/Notes/Details

Exterior Lighting Fixture Schedule			
ID	Description	Lamp Type	Wattage
1	Wall Pack	LED	20
2	Ballard	LED	25
3	Parking Area	LED	67
4	Façade Lighting	Pulse Start Ceramic Metal Halide	75

- Exterior lighting shall be controlled by an astronomical time switch

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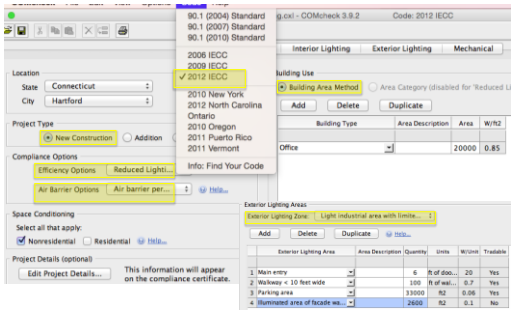
Sample Commercial Project

COMcheck Inputs



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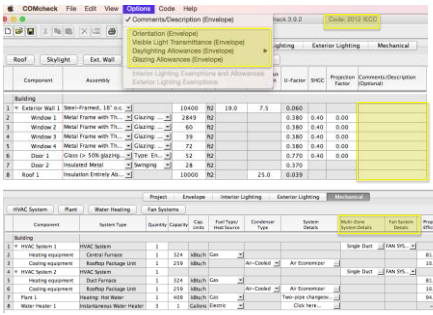
Sample Commercial Project

COMcheck Inputs



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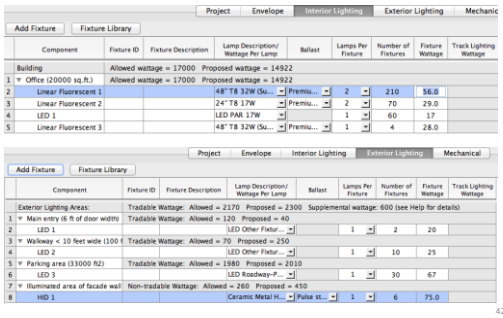
Sample Commercial Project

COMcheck Inputs



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Sample Commercial Project

COMcheck Report

COMcheck Software Version 3.9.2
Envelope Compliance Certificate
2012 IECC

Section 2: General Information

Building Location (for weather data): **Hartford, Connecticut**
Climate Zone: **6a**
Building Type for Envelope Requirements: **Nonresidential**
Vertical Glazing / Wall Area Pct.: **30%**

Building Type	Floor Area
Office	35000

Section 3: Requirements Checklist

Envelope PASSES: Design 0.1% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Exterior Wall 1: Steel-Framed, 16" o.c.	10480	19.0	7.5	0.060	0.064
Window 1: Metal Frame with Thermal Break Double Pane, Clear, Fixed, SHGC 0.40	2849	---	---	0.380	0.380
Window 2: Metal Frame with Thermal Break Double Pane, Clear, Fixed, SHGC 0.40	60	---	---	0.380	0.380
Window 3: Metal Frame with Thermal Break Double Pane, Clear, Fixed, SHGC 0.40	39	---	---	0.380	0.380
Window 4: Metal Frame with Thermal Break Double Pane, Clear, Fixed, SHGC 0.40	72	---	---	0.380	0.380
Door 1: Glass (> 50% glazing) Metal Frame, Entrance Door, SHGC 0.40	52	---	---	0.770	0.380
Door 2: Insulated Metal, Swinging	28	---	---	0.370	0.370
Roof 1: Insulation Entirely Above Deck	10000	---	25.0	0.039	0.039

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

☐ 1. Continuous air barrier is provided throughout the building thermal envelope.
☐ 2. Air barrier joints and seams are sealed. The joints and seals are securely installed in or on the joint for its entire length.

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Sample Commercial Project

COMcheck Report

COMcheck Software Version 3.9.2
Envelope Compliance Certificate
2012 IECC

Air Leakage, Component Certification, and Vapor Retarder Requirements:

☐ 1. Continuous air barrier is provided throughout the building thermal envelope.
☐ 2. Air barrier joints and seams are sealed. The joints and seals are securely installed in or on the joint for its entire length.
☐ 3. Penetrations of the air barrier and paths of air leakage are caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Joints and seals are sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. The joints and seals are securely installed in or on the joint for its entire length.
☐ 4. The air barrier is continuous for all assemblies that are the thermal envelope and across the joints and assemblies.
☐ 5. Recessed lighting fixtures installed in the building envelope are Type IC rated as meeting ASTM E283, tested to <=2.0 cfm, and are sealed with gasket or caulk.
☐ 6. Materials making up the air barrier have air permeability <=0.004 cfm/ft2 or are qualifying materials as per Section C402.4.1.2.1.
☐ 7. Air leakage of fenestration. Windows/non-glazed sliding and swinging doors/skylights with no weepage openings <= 0.20 cfm/ft2. Skylights with weepage <= 0.30 cfm/ft2. Curtain walls/storefront glazing <= 0.06 cfm/ft2. Doors: glazed swinging entrance/revolving/rolling <= 1.00 cfm/ft2. Doors: garage <= 0.40 cfm/ft2.

Exceptions:

☐ Field-fabricated assemblies.

☐ 8. Doors and access openings from conditioned space to shafts, chutes stairways and elevator lobbies are gasketed, weatherstripped or sealed.

Exceptions:

☐ Door openings required to comply with International Building Code as per Section C402.4.4.

☐ 9. Stairway and shaft vents are provided with Class I motorized dampers with a leakage rate <= 4 cfm/ft2. Dampers are installed with controls so that they are capable of automatically opening upon activation of any fire alarm or the interruption of power to the damper.
☐ 10. Outdoor air supply and exhaust openings are provided with Class IA motorized dampers having a leakage rate <=4 cfm/ft2.

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Sample Commercial Project

COMcheck Report

COMcheck Software Version 3.9.2
Exterior Lighting Compliance Certificate
2012 IECC

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Main entry	6 ft of door width	20	Yes	120	40
Walkway < 10 feet wide	100 ft of walkway length	0.7	Yes	70	250
Parking area	33000 ft2	0.06	Yes	1980	2010
Illuminated area of facade wall or surface	2600 ft2	0.1	No	260	450
			Total Tradable Watts* =	2170	2300
			Total Allowed Watts =	2430	
			Total Allowed Supplemental Watts** =	600	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfac

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Main entry (6 ft of door width): Tradable Wattage				
LED 1: LED Other Fixture Unit 40W:	1	2	20	40
Walkway < 10 feet wide (100 ft of walkway length): Tradable Wattage				
LED 2: LED Other Fixture Unit 25W:	1	10	25	250
Parking area (33000 ft2): Tradable Wattage				
LED 3: LED Roadway-Parking Unit 67W:	1	30	67	2010
Illuminated area of facade wall or surface (2600 ft2): Non-tradable Wattage				
HID 1: Ceramic Metal Halide: Pulse start:	1	6	75	450
			Total Tradable Proposed Watts =	2300

Section 4: Requirements Checklist

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COMcheck Report

COMcheck Software Version 3.9.2
Interior Lighting Compliance Certificate
2012 IECC

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Office (20000 sq.ft.)				
Linear Fluorescent 1: 1: 2x4 Troffer: 48" T8 32W (Super T8): Premium efficiency:	2	210	56	11760
Linear Fluorescent 2: 2a: 2x2 Troffer: 24" T8 17W: Premium efficiency:	2	70	30	2100
Linear Fluorescent 3: 2b: 2x2 Troffer: 24" T8 17W: Premium efficiency:	2	70	28	1960
Linear Fluorescent 4: 4: 1x4 Wall Mount: 48" T8 32W (Super T8): Premium efficiency:	1	4	28	112
LED 1: 3: 6" Downlight: LED Other Fixture Unit 16W:	1	30	16	480
			Total Proposed Watts =	16412

Section 4: Requirements Checklist

Lighting Wattage:

☐ 1. Total proposed watts must be les
Allowed Wattage: 17000 Prop
Complies: YES

Mandatory Requirements:

☐ 2. Dwelling units (complete indepen
requirements of this code provid
high efficacy lamps.

☐ 3. Manual Controls: Each enclosed

Additional Efficiency Package Requirements:

☐ 1. The reduced interior lighting power option has been selected as the additional efficiency package required by this energy code. Requirements for this package are applied to the interior lighting allowance calculations. Full compliance with this efficiency option requires inspection and verification that the interior lighting allowances and fixture schedule are compliant and deemed to pass.

Interior Lighting PASSES: Design 3% better than code

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2012 IECC requirements in COMcheck Version 3.9.2 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title | Signature | Date

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Sample Commercial Project

COMcheck Report

COMcheck Software Version 3.9.2
Mechanical Compliance Certificate
2012 IECC

Section 3: Mechanical Systems List

Quantity	System Type & Description
1	HVAC System 1 (Multiple-Zone) : Heating: 1 each - Central Furnace, Gas, Capacity = 324 kBtu/h Proposed Efficiency = 81.00% Et, Required Efficiency = 80.00% Et Cooling: 1 each - Rooftop Package Unit, Capacity = 259 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 10.00 EER, Required Efficiency = 9.80 EER Fan System: "FAN SYSTEM 2 I Second Floor -- Compliance (Motor nameplate HP method) : Passes Fans: FAN 1 Supply, Multi-Zone VAV, 8000 CFM, 5 motor nameplate hp
1	HVAC System 2 (Multiple-Zone) : Heating: 1 each - Duct Furnace, Gas, Capacity = 324 kBtu/h Proposed Effi Cooling: 1 each - Proposed Effic Fan System: FA Fans: FAN 1 Supply
1	Plant 1: Heating: Hot Wat Proposed Effic
3	Water Heater 1: Electric Instantan No minimum e

Section 4: Requ

Requirements Spe

☐ 1. Equipment minimum

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2012 IECC, Chapter 8, requirements in COMcheck Version 3.9.2 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title | Signature | Date

Section 6: Post Construction Compliance Statement

☐ HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner.

☐ HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.

☐ Written HVAC balancing and operations report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name | Signature | Date

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COMcheck Report

COMcheck Software Version 3.9.2
Mechanical Compliance Certificate
2012 IECC

Requirements Specific To: HVAC System 2 :

☐ 1. Equipment minimum efficiency: Duct Furnace (Gas): 80.00 % Ec
☐ 2. Equipment minimum efficiency: Rooftop Package Unit: 9.80 EER (9.9 IPLV)
☐ 3. Minimum one temperature control device per zone
☐ 4. Integrated air economizer is required for individual cooling systems and allows modulation of outdoor air and return air dampers to provide up to 100% of the design supply air quantity as outdoor air for cooling. All air economizers shall be capable of automatically reducing outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will no longer reduce cooling energy usage.
☐ 5. Air economizer dampers can be sequenced with the cooling equipment and not controlled exclusively by mixed air temperature.
Exception(s):
  ☐ System controlled from space temperature (such as single-zone systems).
☐ 6. Cooling system provides a means to relieve excess outdoor air during economizer operation.
☐ 7. Systems serving more than one zone must be VAV systems
☐ 8. Single-duct VAV terminals reduce primary air before reheating
☐ 9. Controls capable of resetting supply air temp (SAT) by 25% of SAT-room temp difference
Exception(s):
  ☐ Systems that prevent reheating, recooling or mixing of heated and cooled supply air
  ☐ Seventy five percent of the energy for reheating is from site-recovered or site solar energy sources.
  ☐ Zones with peak supply air quantities of 300 cfm (142 L/s) or less.
☐ 10. Hot gas bypass prohibited unless system has multiple steps of unloading or continuous capacity modulation
☐ 11. Hot gas bypass limited to 25% of total cooling capacity
☐ 12. VAV fans with static pressure sensors are located so that controller setpoint is no more than one-third of the total design static pressure. For ducts with major splits, at least one sensor is located on each major branch.
☐ 13. Systems with DDC of individual zone boxes reporting to the central control panel has static pressure setpoint reset based on the zone requiring the most pressure.

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COMcheck Report

COMcheck Software Version 3.9.2
Mechanical Compliance Certificate
2012 IECC

- ☐ 4. Load calculations per ASHRAE/ACCA Standard 183.
- ☐ 5. Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
  Exception(s):
  - ☐ Continuously operating zones
  - ☐ 2 kW demand or less, submit calculations
- ☐ 6. Automatic start controls that can automatically adjust the daily start time of the HVAC system are provided for each system.
- ☐ 7. Outside-air source for ventilation; system capable of reducing OSA to required minimum
- ☐ 8. R-6 supply and return air duct insulation in unconditioned spaces
  R-8 supply and return air duct insulation outside the building
  R-8 insulation between ducts and the building exterior when ducts are part of a building assembly
  Exception(s):
  - ☐ Ducts located within equipment
  - ☐ Ducts with interior and exterior temperature difference not exceeding 15°F.
- ☐ 9. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
- ☐ 10. Pipe serving heating and/or cooling systems is insulated per Section C403.2.8. General applicable insulation requirements are:

Fluid Temp Range (°F)	
> 350	: < 1.0" pipe = 4.5" insulation, otherwise 5.0" insulation
251-350	: < 1.0" pipe = 3.0" insulation, < 1.5" pipe = 4.0" insulation, otherwise 4.5" insulation
201-250	: < 4.0" pipe = 2.5" insulation, otherwise 3.0" insulation
141-200	: < 1.5" pipe = 1.5" insulation, otherwise 2.0" insulation
105-140	: < 1.5" pipe = 1.0" insulation, otherwise 1.5" insulation
40-60	: < 1.5" pipe = 0.5" insulation, otherwise 1.0" insulation
< 40	: < 1.0" pipe = 0.5" insulation, < 8.0" pipe = 1.0" insulation, otherwise 1.5" insulation

Exception(s):

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COMcheck Software Version 3.9.2
Mechanical Compliance Certificate
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- ☐ 11. Operation and maintenance manual provided to building owner
- ☐ 12. Thermostatic controls have 5°F deadband
  Exception(s):
  - ☐ Thermostats requiring manual changeover between heating and cooling
- ☐ 13. Hot water distribution systems >= 300 kBtu/h must have one of the following:
  a) controls that reset supply water temperature by 25% of supply/return delta T
  b) mechanical or electrical adjustable-speed pump drive(s)
  c) two-way valves at all heating coils
  d) multiple-stage pumps
  e) other system controls that reduce pump flow by at least 50% based on load - calculations required
  Exception(s):
  - ☐ Where the supply temperature reset controls cannot be implemented without causing improper operation of heating, cooling, humidification, or dehumidification systems.
  - ☐ Hydronic systems that use variable flow to reduce pumping energy.
- ☐ 14. Demand control ventilation (DCV) present for high design occupancy areas (>25 person/1000 ft2 in spaces >500 ft2) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
  Exception(s):
  - ☐ Systems with heat recovery.
  - ☐ Multiple-zone systems without DDC of individual zones communicating with a central control panel.
  - ☐ Systems with a design outdoor airflow less than 1200 cfm.
  - ☐ Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
  - ☐ Ventilation for process loads only.
- ☐ 15. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
  Exception(s):
  - ☐ Gravity dampers acceptable in buildings <3 stories
- ☐ 16. Automatic controls for freeze protection systems present

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Mechanical Compliance Certificate
2012 IECC

Requirements Specific To: Plant 1 :

- ☐ 1. Equipment minimum efficiency: Boiler Thermal Efficiency 80% Et
- ☐ 2. Two-pipe changeover heating/cooling controls must have:
  a) 15 degrees F deadband where boiler and chiller can not operate,
  b) allow operation in either heating or cooling for at least 4 hrs. and
  c) prevent difference between heating and cooling set points greater than 30 degrees F
- ☐ 3. Systems with multiple boilers have automatic controls capable of sequencing boiler operation
- ☐ 4. Hydronic heating systems comprised of a single boiler and >500 kBtu/h input design capacity include either a multistaged or modulating burner

Requirements Specific To: Water Heater 1 :

- ☐ 1. Water heating equipment meets minimum efficiency requirements: No efficiency requirements for electric instantaneous water heater.
- ☐ 2. First 8 ft of outlet piping is insulated

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Element	ASHRAE/IESNA Standard 90.1-2010 Requirement	Values Incorporated Into This Design

Element	ASHRAE/IESNA Standard 90.1-2010 Requirement	Values In Simulation For Proposed Building Design	Values Incorporated Into This Design

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			

See the instructions and disclaimer for this spreadsheet.	Element	Commercial Chapter 4 [CE] 2012 IECC Requirement	Values Incorporated Into This Design
Section C401			
Application			
Compliance with C402, C403, C404 and C405 **AND** (either C406.2, C406.3 or C406.4)	New Construction		
Compliance with C402, C403, C404 or C405	Existing 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		

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http://aiact.org/about-aia-connecticut/committees/building-performance-regulations/

Building Performance & Regulations
AIA Connecticut Committees

Compliance Forms

2009 International Energy Conservation Code Sample Compliance Forms

- Connecticut 90.1-2007 Compliance (Excel 97-2003 format)
- Connecticut 90.1-2007 ECB Compliance (Excel 97-2003 format)
- Connecticut 2009 IECC Compliance (Excel 97-2003 format)
- Connecticut 2009 IECC TBP Compliance (Excel 97-2003 format)
- Instructions for Compliance Spreadsheet May 19 2011

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Section C402			
Building Envelope (Climate Zone 5A)			
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			

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AIA CT Sample Documentation

Section C402 Building Envelope (Climate Zone 5A)			
Space-Conditioning Category (Nonresidential or Residential)		Nonresidential	
Gross Roof Area			10,000
Roofs: Minimum Insulation R-Value	Insulation Entirely Above Deck	25ci	25ci
Walls: Above-Grade: Minimum Insulation R-Value	Metal Framed	R-13 + R-7.5ci	R-19 + R-7.5ci
Floors: Slab-On-Grade, Minimum Insulation R-Value	Unheated Slab	R-10 for 24"	R-10 for 24"
Opaque Doors: Maximum Assembly U-factor	Swinging	0.37	0.37
Gross Wall Area			10,400
Total Vertical Fenestration Area			3,072
Vertical Glazing: Percent of Wall Area		30%	29.5%
Vertical Glazing: Maximum Assembly U-factor	Fixed Fenestration	0.38	0.38
	Entrance Door	0.77	0.77
Maximum Assembly Solar Heat Gain Coefficient	Fixed Fenestration	0.40	0.40
	Entrance Door	0.40	0.40
Total Skylight Area			0
Skylight: Percent of Roof Area		3%	0%
Air Barriers: Construction	Continuous with Sealed Joints and Seams	Required	Specified, see Drawing A-zz
Compliance Option	Materials	Required as Listed	Specified, see Drawing A-zz
Penetration Sealing	Caulked, Gasketed or Otherwise Sealed	Required	Specified, see Drawing A-zz
Maximum Assembly Air Infiltration Rates	Windows	0.20 cfm/sf	0.20 cfm/sf
	Swinging Doors	0.20 cfm/sf	0.20 cfm/sf
	Commercial Glazed Swinging Entrance Doors	1.00 cfm/sf	1.00 cfm/sf
Damper, Maximum Leakage Rate: Outdoor Air Intakes and Exhausts	Gravity Dampers	20 cfm/sf	20 cfm/sf
Vestibule	Opening to Spaces ≥3,000 sf	Required	Provided
	Self-Closing Devices	Required	Specified, see Drawing A-zz

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Section C403 Heating, Ventilating and Air Conditioning				
Calculated Load		Heating		700 MBH
		Cooling		570 MBH
Equipment Output Capacity (RTU provides after hour heating)		Heating		648 MBH
		Cooling		517.8 MBH
HVAC Equipment Performance				
Unitary Air Conditioners, Electrically Operated, Minimum Efficiency				
	Air-Cooled with Other Than Electric Heating	≥135,000 Btu/h and <240,000 Btu/h	10.8 EER / 11.0 IEER	
		≥240,000 Btu/h and <760,000 Btu/h	10.0 EER / 10.1 IEER	258.9 MBH 10.0 EER / 12.3 IEER
Warm Air Furnaces, Minimum Efficiency	Gas Fired	≥225,000 Btu/h	80%	81%
Boilers, Hot Water, Minimum Efficiency	Gas Fired	≥300,000 Btu/h and ≤2,500,000 Btu/h	80%	94%
Economizers				
Airside (with Relief of Excess Outdoor Air), Capacity		Rooftop AC Units	Required on Systems ≥33,000 Btu/h	Specified, see drawing M-xx
HVAC System Control				
Zone Thermostatic Control		Each Zone	Required	Specified, see drawing M-xx
Independent Perimeter System Thermostatic Control		Each Exposure	Required	Specified, see drawing M-xx
Setpoint Deadband (Overlap Restriction)		All Thermostatic Controls	5° Deadband	5° Deadband
Automatic Off-Hour Setback and Shutdown Zone Control		Operating Range	55° to 85°	55° to 85°
		Different Daily Schedules	7 different daily schedules per	7 different daily schedules per
		Schedule Maintenance During Power Failure	10 Hour Battery	Specified, see drawing M-xx
		Manual Override	Required	Specified, see drawing M-xx
Automatic Start Control			Required	See Sequence of Operation
Automatic Zone Supply and Exhaust Damper Closure Control			Required	See Sequence of Operation

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Economizer Cycle Controls		Allowed Types	Fixed db, Differential db, Fixed Enthalpy, Electronic Enthalpy, Differential Enthalpy	Differential Enthalpy
		Integrated with Equipment	Required	See Sequence of Operation
		High-Limit Airside Shutoff	Fixed db, Differential db, Fixed Enthalpy, Electronic Enthalpy, Differential Enthalpy	Differential Enthalpy
Ventilation System Controls				
Ventilation Damper Controls		In Rooftop Units	Required	See Sequence of Operation
Shutoff Damper Controls		At VAV Boxes	Required	See Sequence of Operation
Rate		At VAV Boxes	4 cfm/sf	4 cfm/sf
Demand Control Ventilation			Required for space >500 sf & Avg Occupant Load ≥25 People per 1,000 sf	N/A
HVAC System Insulation and Sealing				
Insulation For Supply Duct, R-Value		In Unconditioned Space	R-6	N/A
Insulation For Return Duct, R-Value		In Unconditioned Space	R-6	N/A
Building Envelope and Duct Insulation Separating Duct or Plenum From Exterior,			R-8	Specified, see drawing M-xx
Duct Sealing			Required	Specified
Duct Testing Requirements			Required for High Pressure Ducts	N/A
Pipe Insulation for Heating and Cooling Systems, Conductivity / Minimum Thickness		Fluid Operating Temperature (°F) / Nominal Pipe Size		
		141° - 200° / <1"	1.5" / 0.25-0.29 k	Specified, see drawing M-xx
		141° - 200° / 1" to <11/2"	1.5" / 0.25-0.29 k	Specified, see drawing M-xx

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AIA CT Sample Documentation

Exhaust Air Energy Recovery System			
Percentage Outdoor Air at Full Design Supply Fan Airflow Rate	≥30% and <40% @ ≥5,500 cfm	Required	N/A / 25% OA
Maximum Allowable Fan Horsepower (Nameplate Horsepower Option)	Variable Volume	hp ≤ CFM x 0.0015	Specified 5 hp < 12
Variable Air Volume System Controls			
Variable Flow Control		Required	VFD in RTU
DDC Static Pressure Reset Control		Required	See Sequence of Operation
Supply Air Temperature Reset Control		Required	See Sequence of Operation
Air Reheating, Recooling and Mixing Limitations		Required	See Sequence of Operation
Hydronic			
Water Temperature Reset Controls		Required or Flow Control	See Sequence of Operation
System		≤25%	None
Mechanical Systems Commissioning and Completion Requirements in Section C408.2		Required	Specified

Section C404 Service Water Heating			
Water Heating Equipment, Minimum Performance			
Electric Resistance - Storage	≤12 kW		N/A for Instantaneous Water Heater
Pipe Insulation for Service Hot-Water Systems, Conductivity / Thickness	Non Temperature Maintenance Systems	½" / 0.27 k for first 8'	Specified, see drawing M-xx

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Sample Commercial Project

AIA CT Sample Documentation

Section C405 Electrical Power and Lighting			
Building Type			Office
Gross Lighted Floor Area			20,000
Interior Lighting Power Allowance	Allowance	17,000	
	Connected		16,412
Equivalent Interior Lighting Power Density by Building Area Method		0.85	0.82
Interior Lighting Controls			
Enclosed Area Lighting Controls	Each Enclosed Area	Manual Switching	
Light Reduction Controls	Entire Building	Required to Achieve ≥50% load Reduction	Specified, see Drawing E-yy
Automatic Building Time Switch Controls	Entire Building	All Except Ones Controlled by Occupancy Sensing Device	Specified, see Drawing E-yy
Occupancy Sensors in Required Areas (Manual On or Automatic On to 50% Power)	Conference/Meeting Rooms	Required	Specified, see Drawing E-yy
	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	Required	Specified, see Drawing E-yy
Specific Application Controls	Supplemental Task Lighting	Required	Specified

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Luminaire Tandem Wiring	High Frequency Ballast	Exception	
Exit Sign: Maximum Wattage per Face		5 watts	3 watts
Exterior Lighting Zone (1, 2, 3, or 4)		2	2
Exterior Lighting Power			
Total Exterior Lighting Power	Allowance	3,030	
	Connected		2,430
Tradable Surface Exterior Lighting Power (with 410 watts of the 600 watts base allowance)	Allowance	2,580	
	Connected		2,300
Non-Tradable Surface Exterior Lighting Power (with 190 watts base allowance)	Allowance	450	
	Connected		450
Exterior Lighting			
Automatic Exterior Lighting Control	Dusk-to-Dawn Operation	Photosensor & Time Switch or Astronomical Time Switch	Astronomical Time Switch
Minimum Lamp Efficacy	>100 watts	60 Lumens per watt	Specified, see Drawing E-yy

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Section C408				
System Commissioning				
Mechanical Systems Commissioning and Completion Requirements				
Commissioning Plan		Narrative Description of Activities	Required	Specified
		Listing of Equipment, Appliances or Systems To Be Tested		
		Functions To Be Tested		
		Test Conditions		
		Measurable Criteria for Performance		
Air System Balancing			Required	Specified
Hydronic System Balancing			Required	Specified
Functional Performance Testing		Equipment in All Modes of Operation	Required	Specified
		Equipment in Redundant or Automatic Back-up Mode		
		Equipment Performance Alarms		
		Upon Loss and Restoration of Power		
		Controls Sequences		
Preliminary Commissioning Report		Provided to Owner	Required	Specified
		Acceptance of Report by Owner	Letter to Building Official	Owner Will Provide
		Availability for Review	Required	Will Be Available
Documentation Requirements				
	Record Drawings		Required	Specified
	Equipment Capacity Lists			
	Operation Manuals			
	Maintenance Manuals			
	System Control Information			
	System Narrative for Each			
	Systems Balancing Reports			
	Final Commissioning Report			

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Lighting Systems Commissioning and Completion Requirements			
Functional Testing of Automatic Controls		Required	Specified
Occupant Sensor Testing Procedures			
Time Switches Testing Procedures			
Programmable Schedule Control Testing Procedures			
Photosensors or Daylighting Control Testing Procedures			

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Further Questions
and/or
Discussions

Thank You!

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