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COM*check* Basics

Rose Bartlett
Pam Cole

Building Energy Codes Program

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Building Energy Codes Program

www.energycodes.gov

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EER

Building Energy Codes Program

U.S. Department of Energy - Energy Efficiency and Renewable Energy

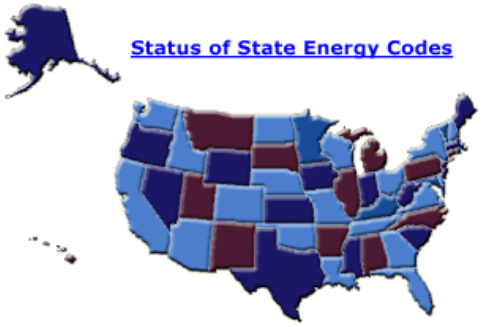
Search energycodes.gov

- About the Program
- Compliance Tools
- Training/Education
- Code Analysis and Development
- Implementation Tools
- Technical Support
- Related Links

The U.S. Department of Energy's Building Energy Codes Program is an information resource on national model energy codes. We work with other government agencies, state and local jurisdictions, national code organizations, and industry to promote stronger building energy codes and help states adopt, implement, and enforce those codes.

The Program recognizes that energy codes maximize energy efficiency only when they are fully embraced by users and supported through education, implementation, and enforcement.

Free Software and Technical Support



Status of State Energy Codes

RES*check*

The RES*check* materials have been developed to simplify and clarify residential code compliance with the Model Energy Code (MEC), the International Energy Conservation Code (IECC), and state-specific codes.

FREE Downloads: RES*check*, RES*check-Web*, RES*check* Package Generator

COM*check*

The COM*check* materials have been developed to simplify and clarify commerical code compliance withe the International Energy Conservation Code (IECC), ANSI/ASHRAE/IESNA Standard 90.1, and state-specific codes.

FREE Downloads: COM*check*, COM*check-Web*, COM*check* Package Generator

Ask an Energy Codes Expert

Need help with the software tools? Need energy codes assistance? Through the Ask an Expert program, energy codes experts are available to answer your specific questions.

Resource Center

The Resource Center is a web-based system designed to provide users with information about energy codes and beyond code technologies. Resources are available in a variety of different media types, including articles, graphics,

EERE Information Center

■ EVENTS

Hold These Dates!
Energy Codes 2009
July 27-30, 2009
Portland, OR

■ FEATURE

Determination Issu
ANSI/ASHRAE/IESNA
Standard 90.1-2004

■ NEWS

Buildings Energy Codes News Headlines

■ PUBLICATIONS

January 2009 *Setting The Standard* Newsletter
posted 01.09.2009

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COM*check*™

Desktop Software Tools

COMcheck™

Windows version or Mac version

Free

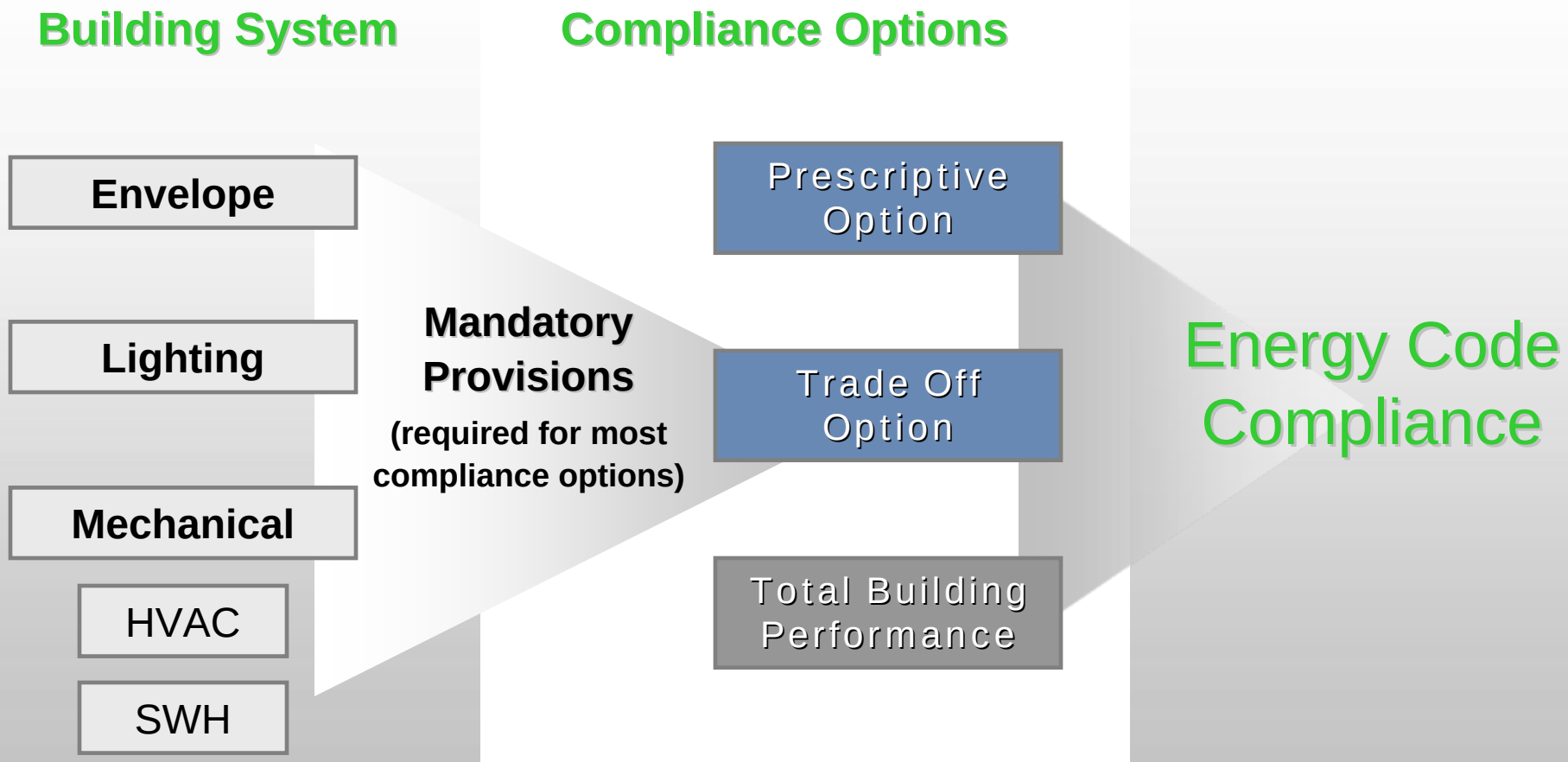
Web-Based Tools

COMcheck•Web™

COMcheck™ Package Generator

Building Energy Codes Program

Commercial Compliance



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More Training Opportunities

- COM*check* 101
- COM*check* 201
- Case studies

www.energycodes.gov

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Info You'll Need

- Basic information about the builder and project
- Area take-offs for exterior walls, fenestration, roof/ceiling, basement walls, floors, etc.
- Insulation R-values, fenestration U-factors, etc.
- Lighting fixture details
- Heating and cooling system details
- Service water heating details

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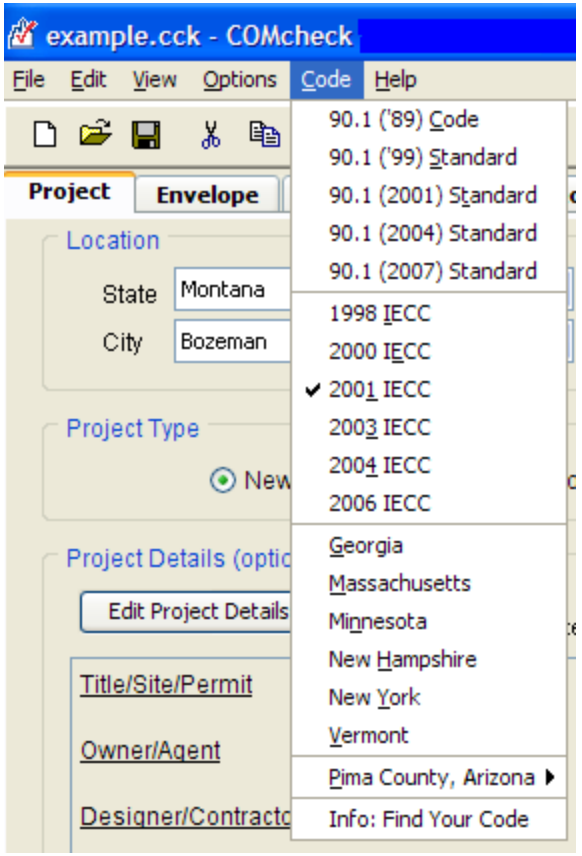
Main Steps

- Select the Appropriate Code
- Enter Project Information
- Enter Building Components
- Enter Interior/Exterior Lighting
- Enter Mechanical Equipment
- View/Print the Compliance Report(s)
- Save the Data File and the Report

Building Energy Codes Program

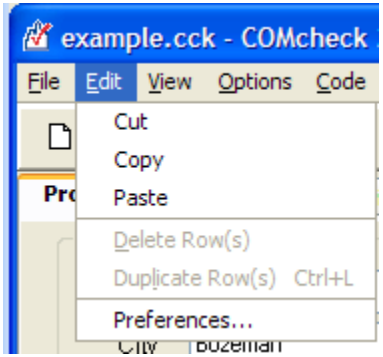
Appropriate Code

- Energy code applicable to your state/ jurisdiction (Code Menu)
  - Status of State Codes
- Default
- Preferences



Preferences

- Edit Menu
- General
  - File Options
  - Beyond Code Advisor
  - Version Update Check
- Project
  - Code/location
  - Envelope
- Applicant
  - Project Details
- Reports
  - Signatures
  - Email Reports



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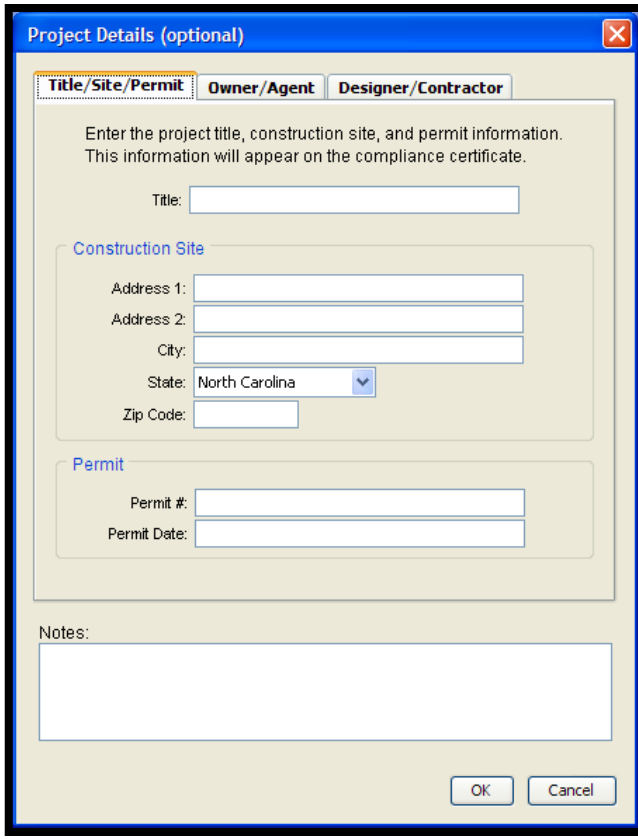
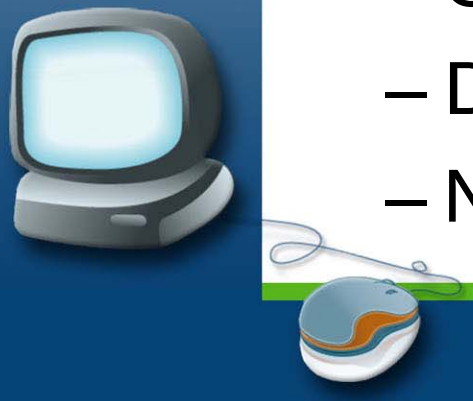
Project Information

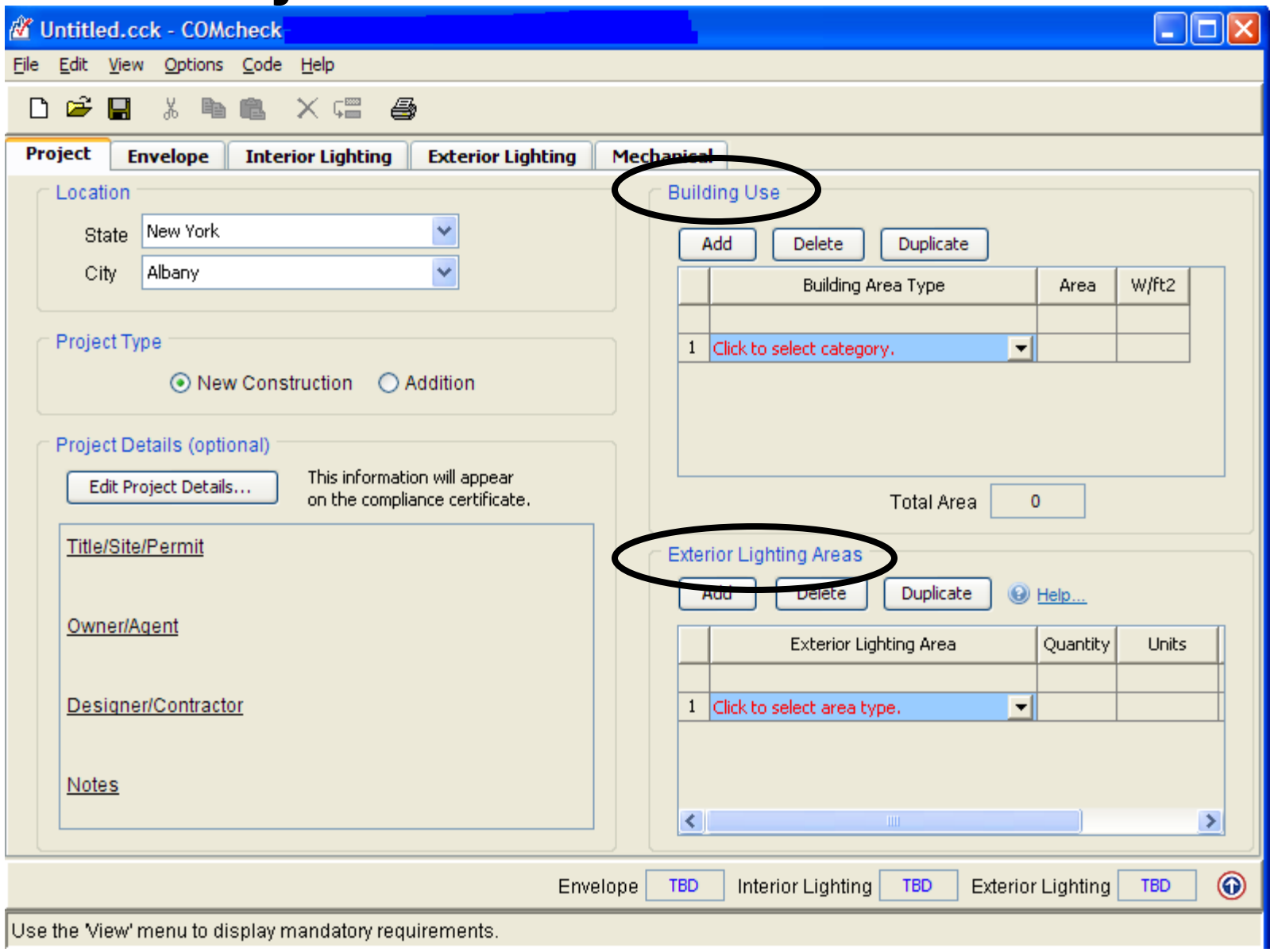
- Project location
- Project type
- Project details for report (optional)
  - Title/Site/Permit
  - Owner/Agent
  - Designer/Contractor
  - Notes





Building Energy Codes Program

Project Screen



Building Use Types

- Vary by code
- Internal loads
- Lighting power allowances

Building Components

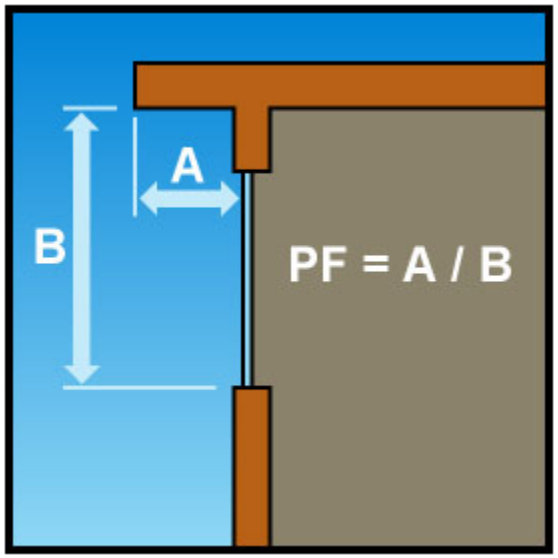
- Only components that separate conditioned space from unconditioned space/outside air
- Only use applicable buttons
- Can group “like” components
- Use of “other” assembly type
- Gross area

Foundations

- Basement button – use if
  - basement is conditioned
  - basement walls are insulated
- Floor button – use if
  - separates conditioned from unconditioned space

Envelope Screen

- Entries can change based on code and/or location selected
  - Assembly types
  - *Int. Wall* button
- Projection Factor
- Orientation



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Envelope Results

COMcheck Software Version 3.5.3

Envelope Compliance Certificate

2001 IECC

Report Date: 03/13/09

Data filename: C:\Program Files\Check\COMcheck\353\example.cck

Section 1: Project Information

Project Type: **New Construction**
Project Title :

Construction Site: Owner/Agent: Designer/Contractor:

Section 2: General Information

Building Location (for weather data):	**Bozeman, Montana**
Climate Zone:	**15**
Heating Degree Days (base 65 degrees F):	**7836**
Cooling Degree Days (base 65 degrees F):	**283**
Vertical Glazing / Wall Area Pct.:	**23%**

Activity Type(s)	Floor Area
Office	4520
Convention, Conference or Meeting Center	420
Corridor, Restroom, Support Area	1400
Storage, Industrial and Commercial	2520
Industrial Work, < 20 ft Ceiling Height	2700
Lobby - Other	600

Section 3: Requirements Checklist

Envelope PASSES: Design 5% 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
Roof 1: Non-Wood Joist/Rafter/Truss	6112	0.0	26.1	0.037	0.050
Skylight 1: Metal Frame, Double Pane, Tinted, SHGC 0.80	112	---	---	0.500	0.050
Exterior Wall 1: Solid Concrete or Masonry <= 8", Furring: Metal	6000	22.0	0.0	0.114	0.072
Door 1: Glass, Clear, SHGC 0.58	42	---	---	0.700	0.520
Window 1: Metal Frame, Double Pane with Low-E, Tinted, SHGC 0.63	1500	---	---	0.600	0.520
Window 2: Metal Frame, Double Pane, Clear, SHGC 0.72	56	---	---	0.700	0.520
Door 2: Overhead	288	---	---	0.140	0.118
Door 3: Solid	40	---	---	0.200	0.118
Interior Wall 2: Metal Frame, 16" o.c.	812	22.0	0.0	0.106	0.118
Basement Wall 1: Solid Concrete or Masonry <= 8", Furring: None, Wall Ht 12.5, Depth B.G. 7.0	2000	---	10.8	0.082	0.096
Floor 1: Slab-On-Grade:Unheated, Vertical 2 ft	160	---	10.8	---	---

Building Energy Codes Program

Interior Lighting

- Mandatory requirements
- Interior lighting power requirements
  - Complies if total connected power is less than interior lighting power allowance (entire building or partial building)

Proposed Wattage	≤	Allowed Wattage

Interior Lighting

- LPDs based on Building Use on *Project* screen
- Add fixtures

	Component	Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage
	Building	Allowed wattage = 17320 Proposed wattage = 12478						
1	Office (4520 sq.ft.)	Allowed wattage = 6780 Proposed wattage = 1976						
2	Incandescent 1	G	Recessed wall washer	Incandescent 150W		1	2	150
3	Incandescent 2	H	Accent track lighting	Incandescent 50W		1	5	50
4	Compact Fluorescent 1	F	Down light, twin tube	Twin Tube 18W	Magnetic	2	31	46
5	Convention, Conference or M	Allowed wattage = 630 Proposed wattage = 3900						
6	T8 / T12 Fluorescent 5	E	8 ft. Industrial, penda...	96" T8 75W	Electronic	2	30	130

- Identify exemptions and allowances (if applicable)

Exemptions and Allowances

- Options menu
- Based on code selected
- Exemptions
  - Power for exempt fixtures is omitted from the **proposed wattage**
- Allowances
  - **Allowed wattage** for building increased by allowable amount

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Interior Lighting Results

COMcheck Software Version 3.6.0

Interior Lighting Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title :
Construction Site: Owner/Agent: Designer/Contractor:

Section 2: General Information

Building Use Description by: Activity Type

Activity Type(s)	Floor Area
Office	4520
Convention Center	420
Warehouse	2520

Section 3: Requirements Checklist

Interior Lighting:

☐ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
7040	6136	YES

Controls, Switching, and Wiring:

☐ 2. Independent controls for each space (switch/occupancy sensor).
Exceptions:
Areas designated as security or emergency areas that must be continuously illuminated.
Lighting in stairways or corridors that are elements of the means of egress.

☐ 3. Master switch at entry to hotel/motel guest room.

☐ 4. Individual dwelling units separately metered.

☐ 5. Each space provided with a manual control to provide uniform light reduction by at least 50%.
Exceptions:
Only one luminaire in space;
An occupant-sensing device controls the area;
The area is a corridor, storeroom, restroom, public lobby or sleeping unit.
Areas that use less than 0.6 Watts/sq.ft.

☐ 6. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.
Exceptions:
Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.

☐ 7. Photocell/astronomical time switch on exterior lights.
Exceptions:
Lighting intended for 24 hour use.

☐ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).
Exceptions:
Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 4: Compliance Statement

COMcheck Software Version 3.6.0

Interior Lighting Application Worksheet

2006 IECC

Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Office	4520	1	4520
Convention Center	420	1.2	504
Warehouse	2520	0.8	2016
		Total Allowed Watts =	7040

Section 2: Proposed Lighting Power Calculation

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Office (4520 sq.ft.)				
Incandescent 1: G: Recessed wall washer / Incandescent 150W	1	2	150	300
Incandescent 2: H: Accent track lighting / Incandescent 50W	1	5	50	250
Compact Fluorescent 1: F: Down light, twin tube / Twin Tube 18W / Magnetic	2	31	46	1426
Convention Center (420 sq.ft.)				
T8 / T12 Fluorescent 5: E: 8 ft. Industrial, pendant mount / 96" T8 75W / Electronic	2	30	130	3900
Warehouse (2520 sq.ft.)				
T8 / T12 Fluorescent 3: C: 4 ft. Wall mout, wrap-around / 48" T8 32W / Electronic	2	4	65	260
			Total Proposed Watts =	6136

Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Proposed Watts is greater than or equal to zero, the building complies.

Total Allowed Watts = 7040
Total Proposed Watts = 6136
Project Compliance = 904

Interior Lighting PASSES: Design 13% better than code.

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Exterior Lighting

- Based on code selected
- Mandatory requirements
- Exemptions

Total Connected Power	<	Ext. Ltg. Power Allowance

Exterior Lighting

- Pay attention to Quantity and Units

Exterior Lighting Areas

Add | Delete | Duplicate | Help...

	Exterior Lighting Area	Quantity	Units	W/Unit	Tradable
1	Drive-up window	2	window(s)	400	No
2	Main entry/exit	4	ft of door ...	30	Yes
3	Parking area(s)	15000	ft2	0.15	Yes
4	Walkway < 10 feet wide	100	ft of walk...	1.0	Yes

- Tradable
  - Common applications where unused power can be traded where needed
- Non-Tradable
  - Less common applications that cannot be traded

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Exterior Lighting Results

COMcheck Software Version 3.5.3

Exterior Lighting Compliance Certificate

2006 IECC

Report Date: 03/12/09
Data filename: C:\Program Files\Check\COMcheck\353\example.cck

Section 1: Project Information

Project Type: **New Construction**
Project Title :

Construction Site: Owner/Agent: Designer/Contractor:

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (C x D)	F Proposed Watts
Drive-up window	2 window(s)	400	No	800	960
Main entry/exit	4 ft of door width	30	Yes	120	84
Parking area(s)	15000 ft2	0.15	Yes	2250	2200
Walkway < 10 feet wide	100 ft of walkway length	1	Yes	100	99
			Total Tradable Watts* =	2470	2383
			Total Allowed Watts =	3270	
			Total Allowed Supplemental Watts** =	164	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 5% of total allowed wattage may be applied toward compliance of both non-tradable and tradable areas/surfaces.

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)
Drive-up window (2 window(s)): Non-tradable Wattage				
HID 1: Metal Halide 100W / Magnetic	1	8	120	960
Main entry/exit (4 ft of door width): Tradable Wattage				
Compact Fluorescent 1: Spiral 42W / Electronic	1	2	42	84
Parking area(s) (15000 ft2): Tradable Wattage				
HID 2: Metal Halide 100W / Magnetic	1	5	440	2200
Walkway < 10 feet wide (100 ft of walkway length): Tradable Wattage				
HID 3: Metal Halide 32W / Electronic	1	3	33	99
			Total Tradable Proposed Watts =	2383

Section 4: Requirements Checklist

Lighting Wattage:

☐ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.
Compliance: Passes using supplemental allowance watts.

Controls, Switching, and Wiring:

Building Energy Codes Program

Mechanical Equipment

- Works differently than Envelope and Lighting
- Enter characteristics of
  - HVAC system
  - Plant
  - Water heating
- Generates a customized list of requirements

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Mechanical Report

COMcheck Software Version 3.6.0

Mechanical Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: New Construction
Project Title :

Construction Site: Owner/Agent: Designer/Contractor:

Section 2: General Information

Building Location (for weather data):	Bozeman, Montana
Climate Zone:	6b
Heating Degree Days (base 65 degrees F):	7836
Cooling Degree Days (base 50 degrees F):	1769

Section 3: Mechanical Systems List

Quantity	System Type & Description
2	RT-2 & RT-3 - Pkg. gas/elec.: RT-2 & RT-3 - Pkg. gas/elec.
1	CU-1 - Condensing unit: Cooling: Field-Assembled DX System, Capacity >=90 - <135 kBtu/h, Air-Cooled Condenser / Single Zone
1	UH-1 - Gas unit heater: Heating: Unit Heater, Gas
1	F-1 - Gas furnace: Heating: Central Furnace, Gas / Single Zone

Section 4: Requirements Checklist

Requirements Specific To: RT-2 & RT-3 - Pkg. gas/elec. :

- ☐ 1. Newly purchased heating equipment meets the heating efficiency requirements
- ☐ 2. Specified equipment consists of field-assembled components - efficiency documentation provided
- ☐ 3. Cooling system provides a means to relieve excess outdoor air during economizer operation.
- ☐ 4. Integrated air economizer required

Requirements Specific To: CU-1 - Condensing unit :

- ☐ 1. Specified equipment consists of field-assembled components - efficiency documentation provided
- ☐ 2. Cooling system provides a means to relieve excess outdoor air during economizer operation.
- ☐ 3. Integrated air economizer required

Requirements Specific To: UH-1 - Gas unit heater :

- ☐ 1. Equipment minimum efficiency: Unit Heater (Gas): 80% Ec

Requirements Specific To: F-1 - Gas furnace :

- ☐ 1. Newly purchased heating equipment meets the heating efficiency requirements

Generic Requirements: Must be met by all systems to which the requirement is applicable:

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Mandatory Requirements

- Must be met by all buildings
- Included in compliance report(s)
- Viewable in software Help

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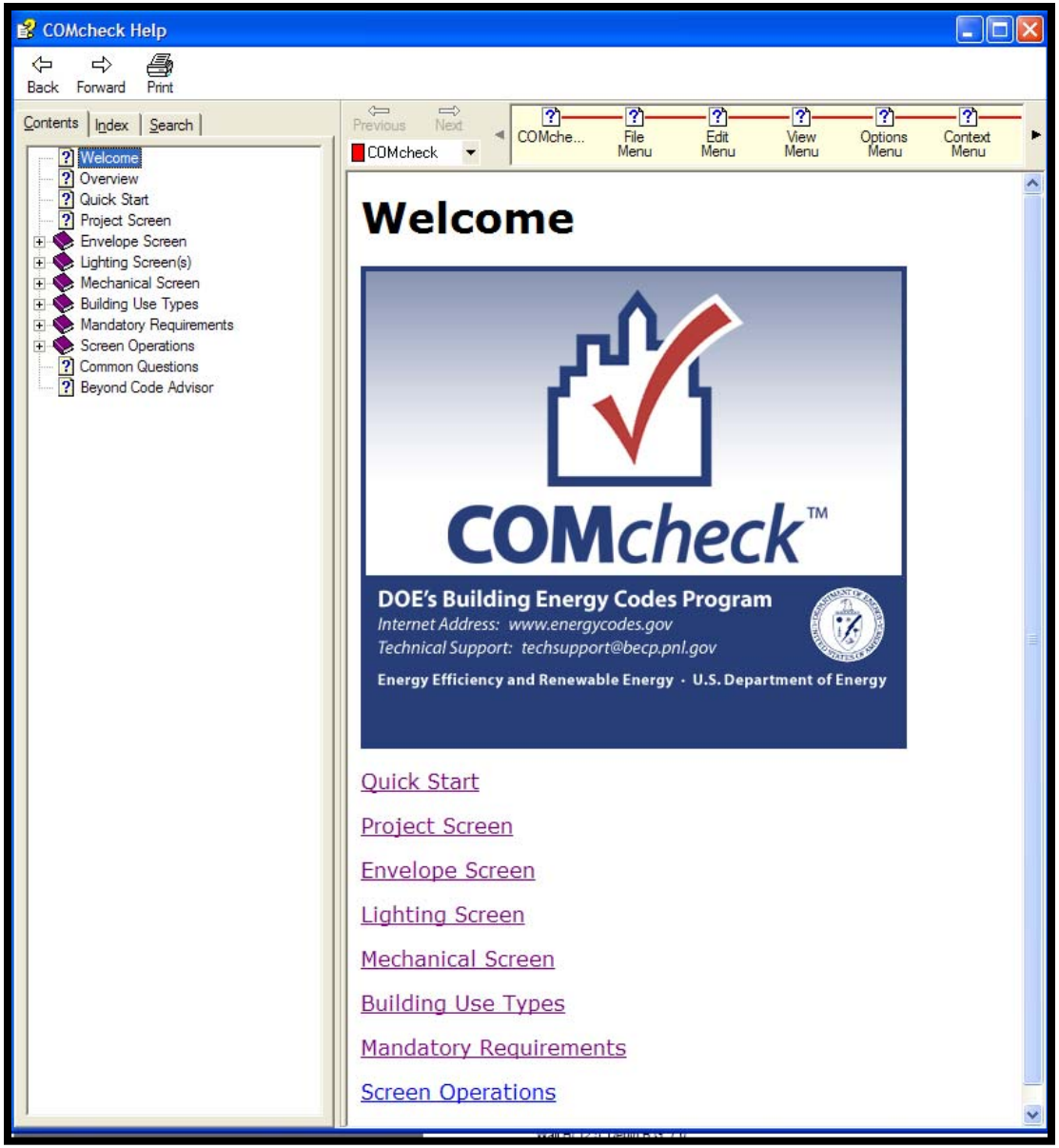
Help



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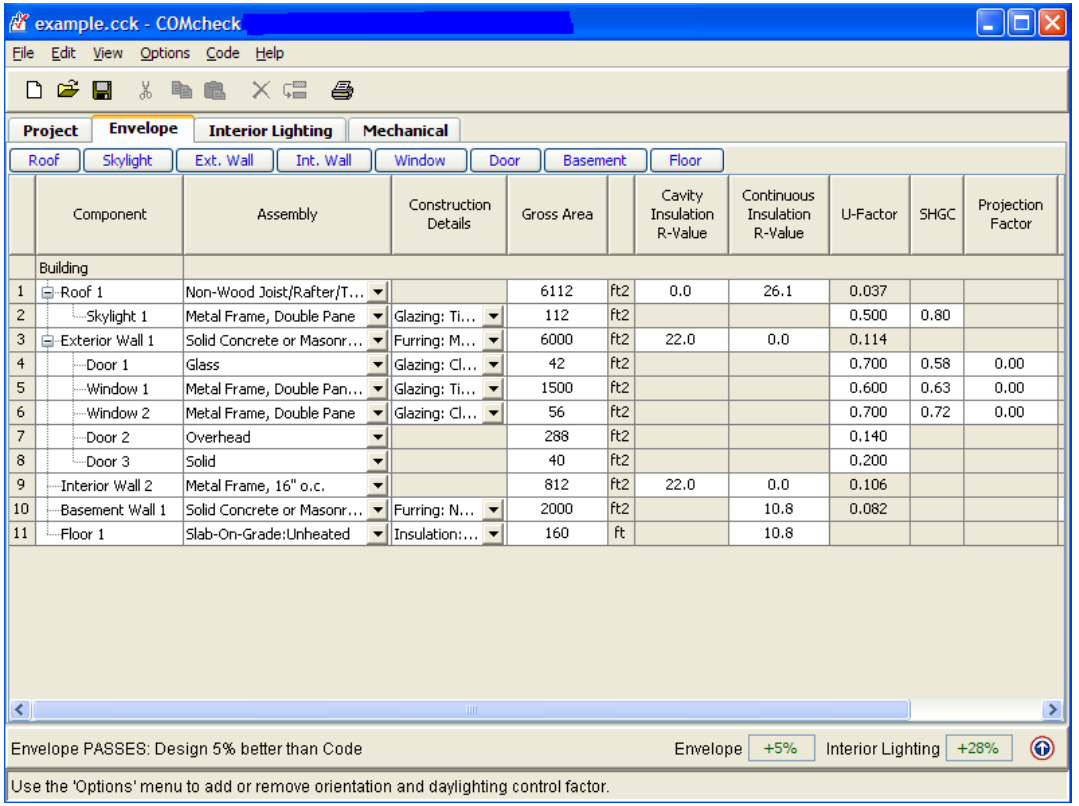
Screen Operations



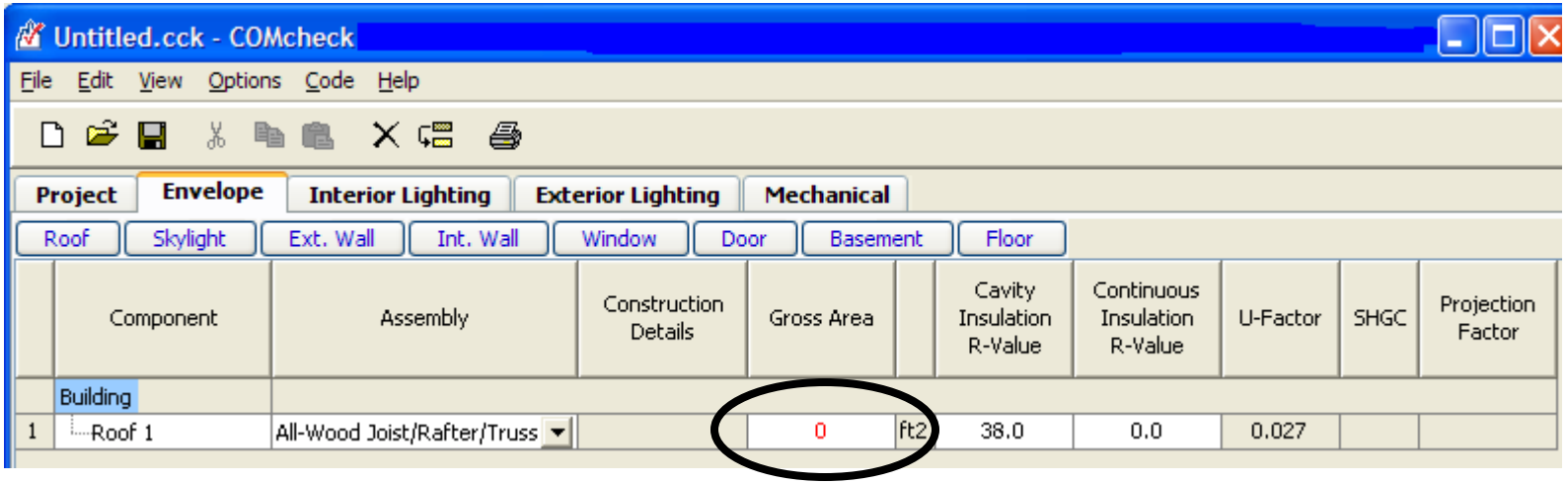
Compliance Bar →

Status Bar →

Building Energy Codes Program

Screen Operations

- Compliance Bar
- Status Bar
- Colors - Red



Screen Operations

- Compliance Bar
- Status Bar
- Colors - Green

Screen Operations

- Compliance Bar
- Status Bar
- Colors - Blue

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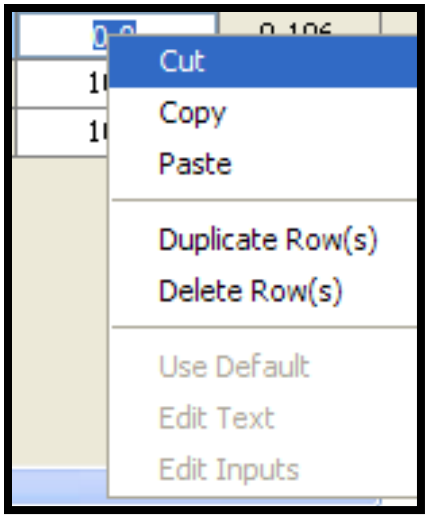
Screen Operations

- Compliance Bar
- Status Bar
- Colors
- Right Mouse Button
  - "Context" Menu



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Files

- Data (*File* ⇨ *Save*)
- Report (*File* ⇨ *Save Report*)
- Exchange

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Common Questions

- Can I trade over-compliance in Envelope for under-compliance in Lighting?
- Cavity vs. continuous insulation
- “xxxx version”

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