IECC, RES*check*, and COM*check*

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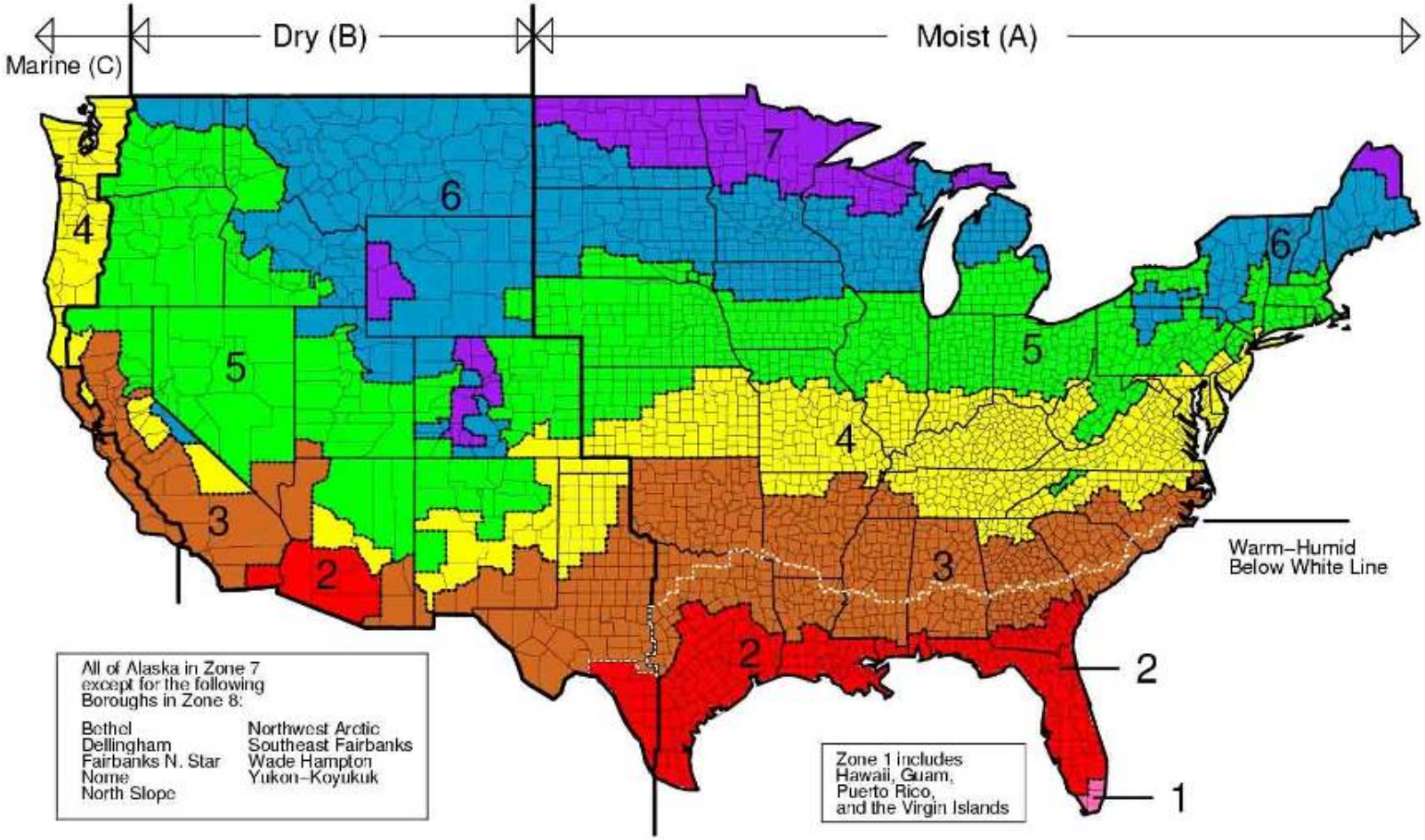
PNNL-SA-68847

Presentation Outline

- Changes between the 2009 IECC and 2006 IECC
- Sources of Additional Information
- Brief Overview of RES*check*
- Brief Overview of COM*check*

Climate Zones – 2009 IECC



New England Climate Zones

- New England is mostly climate zones 5 and 6, with small areas of climate zone 4 (area around New York City) and climate zone 7 (northern Maine)

Changes in Residential Requirements

- Stringency – some key differences
- New requirements
  - Building envelope tightness
  - Duct testing
  - Lighting equipment
  - Pool controls and covers
  - Snow melt controls
- Moisture control requirements moved to IRC
- No mechanical trade-offs allowed

Envelope Stringency Changes

Change to 2009 IECC

- Fenestration U-factor, CZ4, lowered from 0.4 to 0.35
- Wood frame wall U-factor, CZ5-CZ6, lowered from 0.060 to 0.057
  - minimum R-value for "batt-only" raised from 19 to 20
- Mass wall U-factor unchanged, CZ4-CZ7
  - but minimum R-value, raised for interior insulation
- Basement wall U-factor, CZ6-CZ7, lowered from 0.059 to 0.050
  - (minimum R-value raised from 10/13 to 15/19)

How it is handled in REScheck

- All these stringency requirements are included in the base case building, meaning that certain designs that passed under the 2006 IECC will now fail under the 2009 IECC
  - U-factor changes are addressed in REScheck
  - R-value changes with no change in U-factor are not

Building Envelope Tightness

Change to 2009 IECC

- Mandatory air leakage section for building thermal envelope (402.4.1) has been revised to mention attic access openings and rim joist junctions
- New air sealing and insulation section (402.4.2) added with testing and visual inspection options

How it is handled in REScheck

- These requirements have been added to the checklist items

Duct Testing

Change to 2009 IECC

- New duct testing requirements in Section 403.2.2 for either a post construction or rough-in test, unless ducts and air handler are located within conditioned space

How it is handled in REScheck

- A new checkbox has been added to the Building Characteristics section, asking whether or not the ducts and air handlers are in conditioned floor space. How this checkbox is answered determines the contents of the checklist items

Lighting Equipment

Change to 2009 IECC

- A new requirement in Section 404 that 50% of lamps in permanently installed lighting fixtures be high-efficacy lamps

How it is handled in REScheck

- This requirement has been added to the checklist items

Pool Controls and Covers

Change to 2009 IECC

- A new section 403.9 on pools requires a readily accessible on/off switch, time switches for heaters and pumps, and pool covers

How it is handled in REScheck

- These requirements have been added to the checklist items

Snow Melt Controls

Change to 2009 IECC

- A new section 403.8 on snow melt controls has been added

How it is handled in REScheck

- This requirement has been added to the checklist items

Moisture Control Requirements to IRC

Change to 2009 IECC

- Moisture control requirements in 402.5 have been moved to the IRC

How it is handled in REScheck

- These requirements have been removed from the checklist items.

No Mechanical Tradeoffs Allowed

Change to 2009 IECC

- Heating and cooling system efficiencies are set to “as proposed” in both the standard reference design and proposed design in Table 405.5.2(1)
- This removes the justification for the simple mechanical systems tradeoff used in RES*check*

How it is handled in REScheck

- The mechanical system tradeoff has been disabled
- If the UA compliance path is chosen, no mechanical system input is allowed and no credit is given
- If the performance compliance path is chosen, mechanical system input is allowed and some minimal credit may be given in certain circumstances

Changes in Commercial Requirements

- Envelope
  - Addition of U-factor table
  - Stringency – some key differences
  - Addition of residential occupancy
- Lighting
  - Daylight zone control
  - New exterior lighting zones
- Mechanical
  - Snow melt system controls
  - Demand control ventilation
  - Allowable fan floor horsepower

Addition of U-factor table

Changes to the 2009 IECC

- Table 502.1.2 with opaque assembly U-factor requirements was added, making it clear that assemblies other than those listed in the prescriptive R-value tables may be used

How it is handled in COM*check*

- COM*check* utilizes the U-factor tables in the IECC

Envelope Stringency Changes - Roofs

Changes to the 2009 IECC

- Insulation above deck
  - CZ4, R-value increased from 15 to 20 ci
  - CZ6, increased from 20 to 25 ci
- Metal building roofs, CZ4-CZ7, double layer insulation required
- Attic roofs, CZ4-CZ6, R-value increased to R-38 from R-30

How it is handled in COM*check*

- COMcheck has been updated to read the the appropriate baseline U-factor for roofs from the U-factor tables in the IECC

Envelope Stringency Changes - Walls

Changes to the 2009 IECC

- Mass walls, CZ4-CZ7, R-value increased across all climates
- Metal building walls
  - CZ4, R-value increase from R-13 to R-19
  - CZ5-CZ7, R-value decrease for second layer of insulation from R-13 to R-5.6
- Metal framed walls, CZ4-CZ5, continuous R-value increased to R-7.5 from R-3.8
- Wood framed walls, CZ5-CZ7, continuous insulation requirement added

How it is handled in COM*check*

- COMcheck has been updated to read the the appropriate baseline U-factor for walls from the U-factor tables in the IECC

Envelope Stringency Changes - Fenestration

Changes to the 2009 IECC

- All metal frame windows, CZ7, U-factor decreased from 0.50 to 0.45
- SHGC, CZ7, changed from NR to 0.45
- Skylights – one set of requirements for both plastic and glass skylights, based on old glass skylight requirements

How it is handled in COM*check*

- COMcheck has been updated to read the the appropriate baseline U-factor for windows and skylights from the U-factor tables in the IECC

Addition of Residential Occupancy

Changes to the 2009 IECC

- A separate set of requirements for Group R occupancy was added to the R-value and U-factor tables for opaque assemblies
- All other commercial occupancies use “All other” requirements

How it is handled in COM*check*

- COM*check* already asks the building type for use in the lighting calculations. The building type is used to select the correct opaque envelope requirements

Daylight Zone Control

Changes to the 2009 IECC

- Section 505.2.2.3 requires daylight zone controls for daylight zones
- Daylight zones includes areas under skylights and areas adjacent to vertical fenestration

How it is handled in COM*check*

- This requirement has been added to the checklist items

New Exterior Lighting Zones

Changes to the 2009 IECC

- Section 505.6.2 implements a new series of exterior lighting power requirements based on the type of exterior environment – parks, residential neighborhoods, all other areas, and high-activity commercial districts

How it is handled in COM*check*

- COM*check* will now ask for the type of exterior environment and apply the appropriate baseline requirements

Snow Melt System Controls

Changes to the 2009 IECC

- Section 503.2.4.5 requires automatic shutoff controls for snow melt systems

How it is handled in COM*check*

- This requirement has been added to the checklist items

Demand Control Ventilation

Changes to the 2009 IECC

- Section 5023.2.5.1 requires demand controlled ventilation for spaces larger than 500 ft2 with an average occupant load of 40 people per 1000 ft2

How it is handled in COM*check*

- This requirement has been added to the checklist items

Allowable Fan Floor Horsepower

Changes to the 2009 IECC

- Section 503.2.10.1 limits the fan system motor nameplate horsepower or the fan system braking horsepower

How it is handled in COM*check*

- This requirement has been added to the checklist items

More Information

- RES*check* Software - www.energycodes.gov/rescheck/index.stm

- COM*check* Software - www.energycodes.gov/comcheck/index.stm
  - COM*check* 2009 IECC will be out later in October

More Training

- Webcasts on RES*check*, COM*check*, and the 2009 IECC

  www.energycodes.gov/training/onlinetraining/videos.stm

- Presentations on RES*check*, COM*check*, and the 2009 IECC

  www.energycodes.gov/training/presentations.stm

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Check Software Basics

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RES*check*™ Basics

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RES*check*™

Desktop Software Tools

REScheck™

Windows version or Mac version

Web-Based Tools

REScheck•Web™

REScheck™ Package Generator

Free

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Main Steps

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

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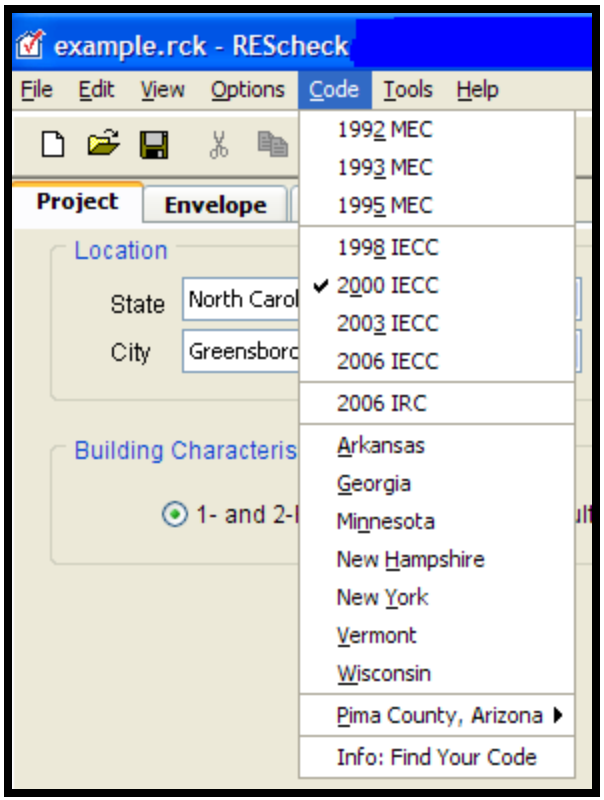
Appropriate Code

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



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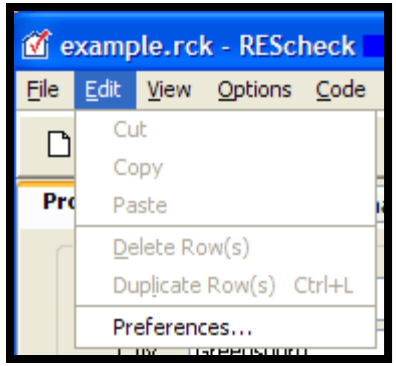
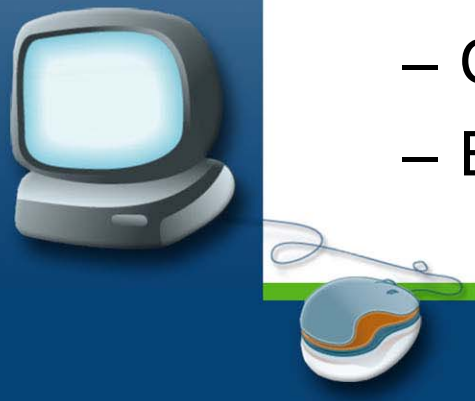
Preferences

- 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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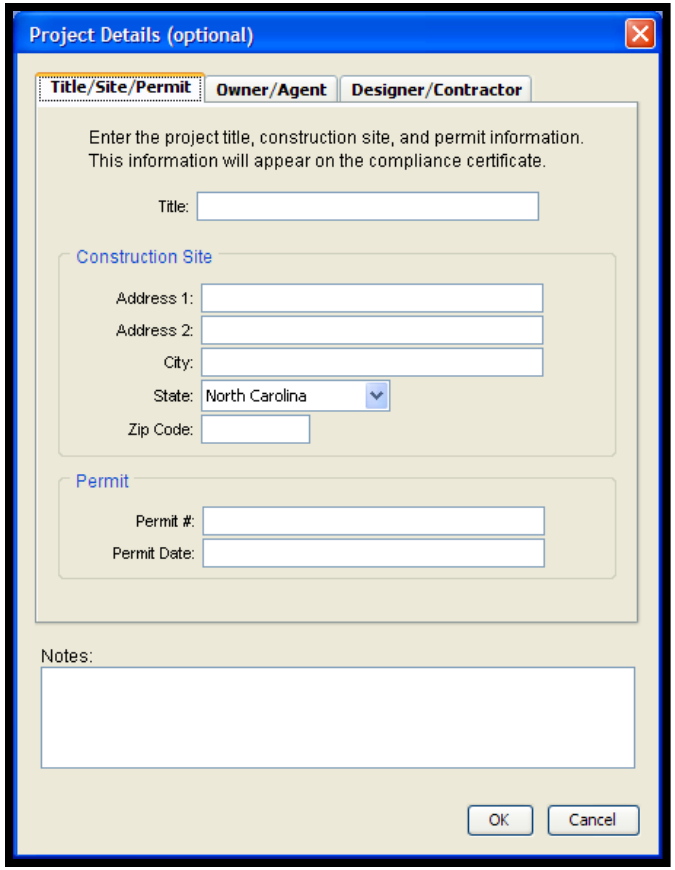
Project Information

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



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Building Components

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

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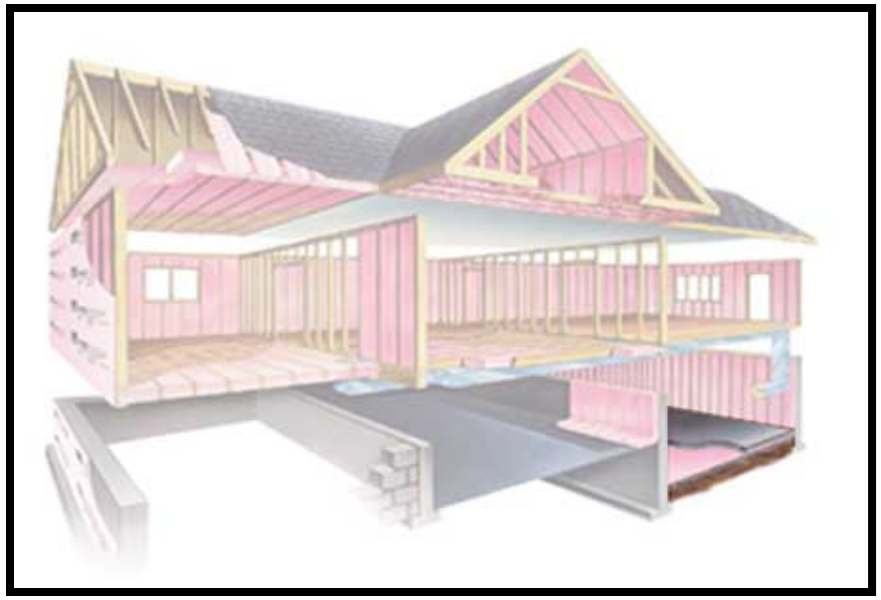
Building Envelope

Consists of:

- Ceiling
- Walls
  - Above grade
  - Below grade
- Fenestration
- Foundation



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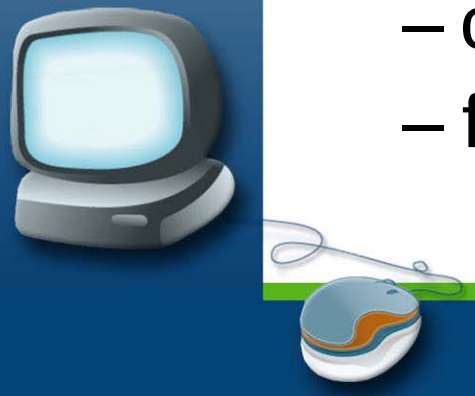
Foundations

- Basement button – use if
  - basement is conditioned and
  - basement walls are insulated
- Floor button – use if
  - separates conditioned from unconditioned space
- Crawl Wall button – use if
  - crawl space is unventilated and
  - floor above is NOT insulated



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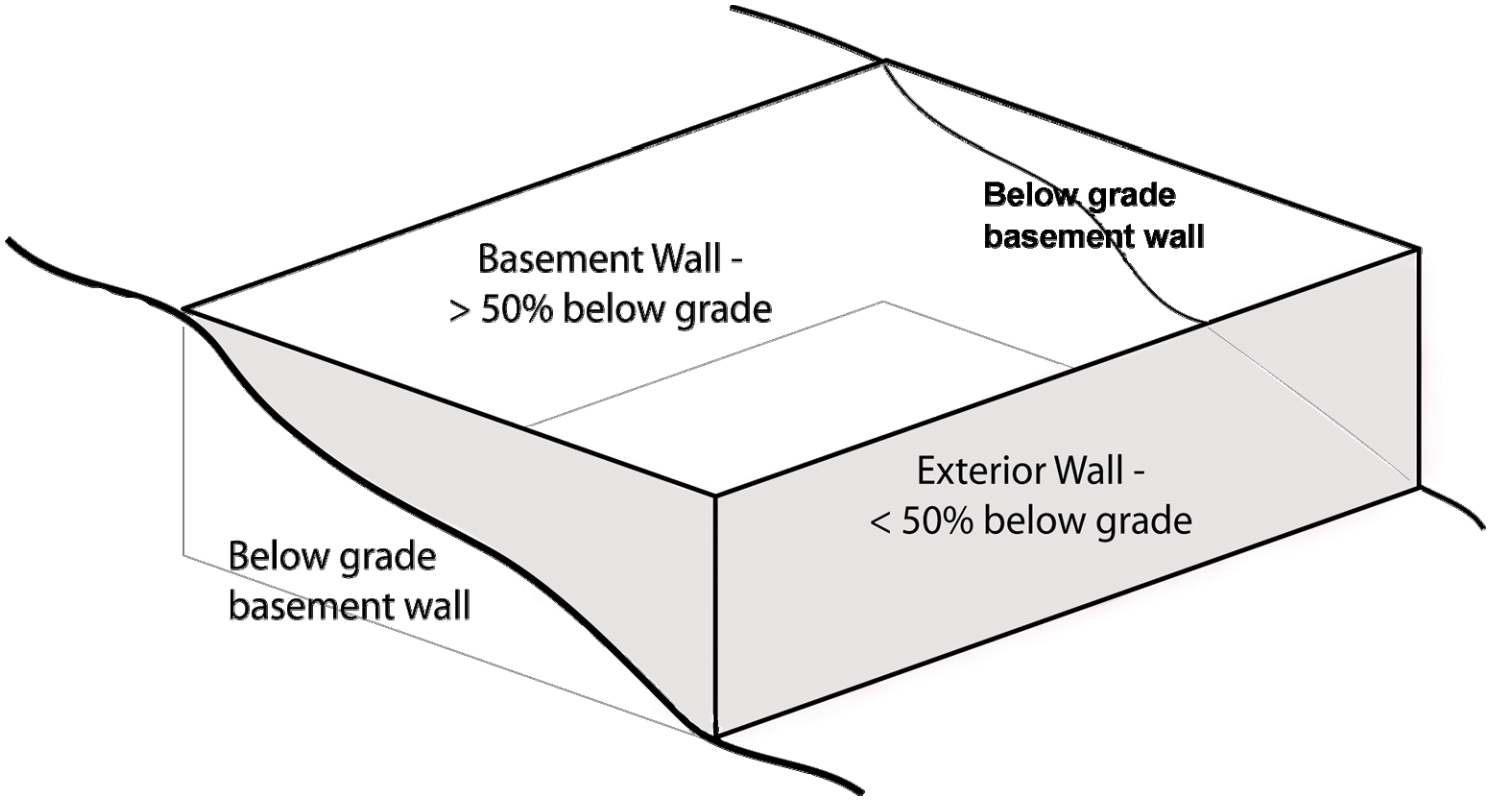
Basement vs. Above-Grade Wall



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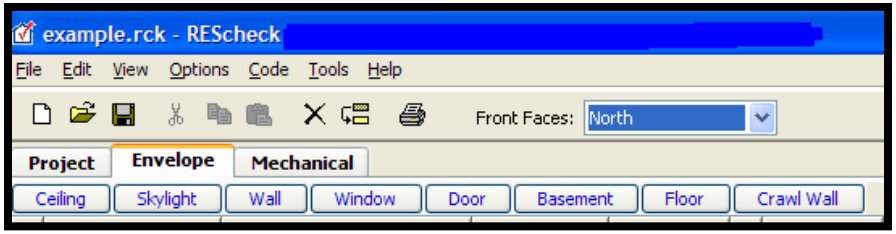
Envelope Screen

- Changes based on code and/or location selected
  - SHGC column
  - Orientation
    - Front Faces
  - Overhang Projection Factor column



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Mechanical Equipment

- Section is entirely optional
- High-efficiency equipment

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Compliance

- UA
  - "Max UA"
  - "Your UA"
- 2006 IECC-based projects
  - New Construction
    - Must enter a roof, walls, and floor assembly
  - Check Compliance button
    - High-efficiency mechanical equipment
    - Performance calculation if UA calculation fails

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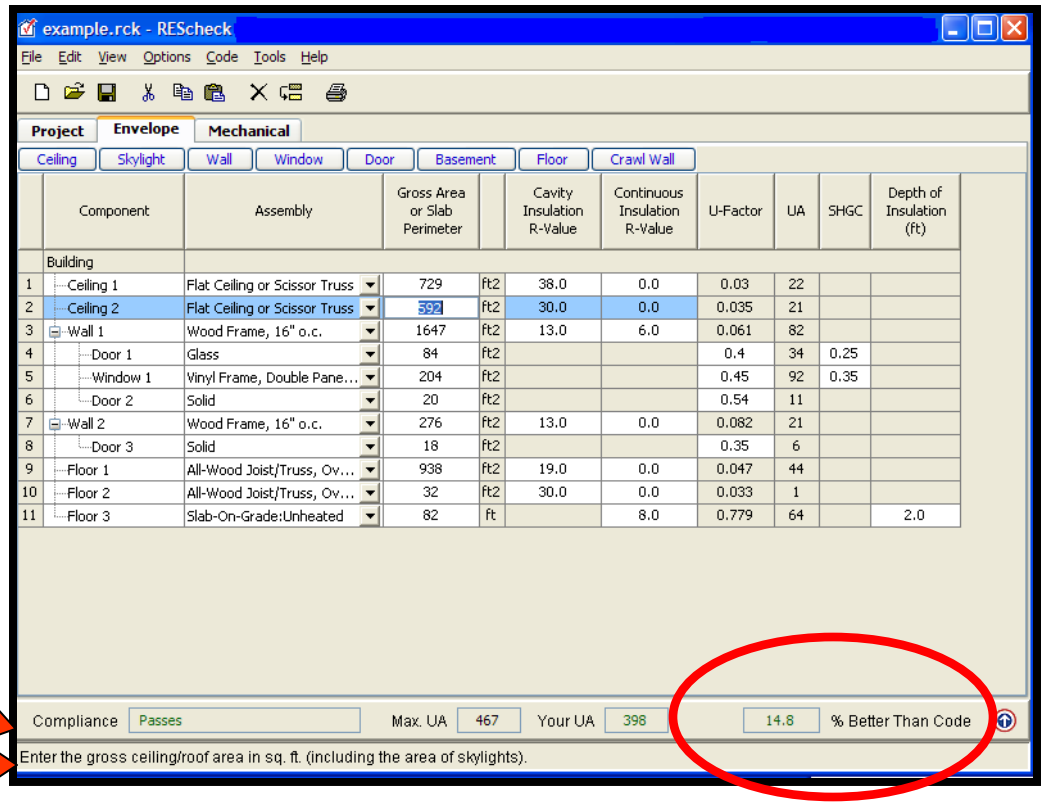
Screen Operations



Compliance Bar

Status Bar

No longer shown in 2009 IECC version

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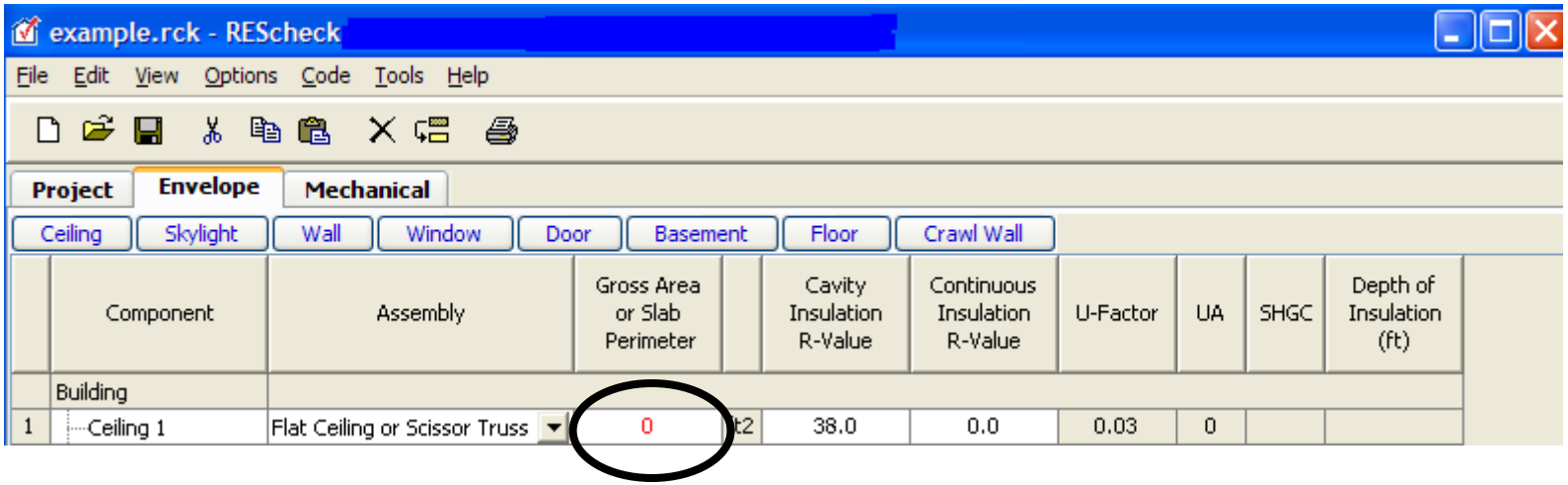
Screen Operations

- Compliance Bar
- Status Bar
- Colors - Red



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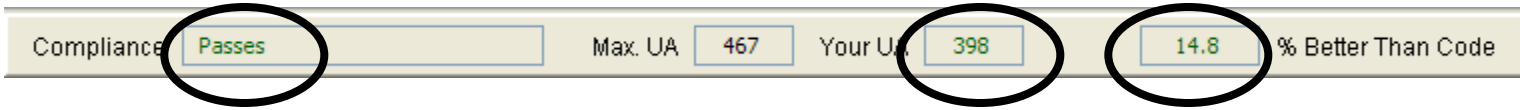
Screen Operations

- Compliance Bar
- Status Bar
- Colors - Green



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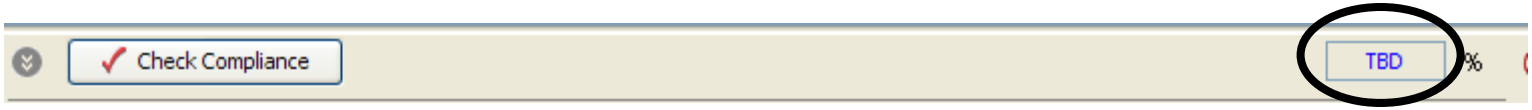
Screen Operations

- Compliance Bar
- Status Bar
- Colors - Blue



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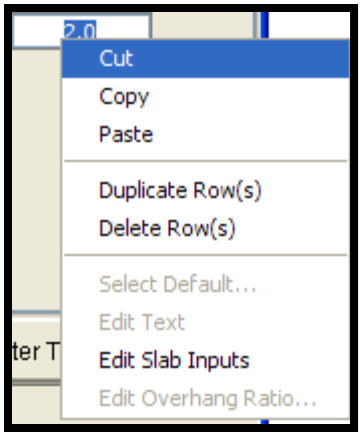
Screen Operations

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



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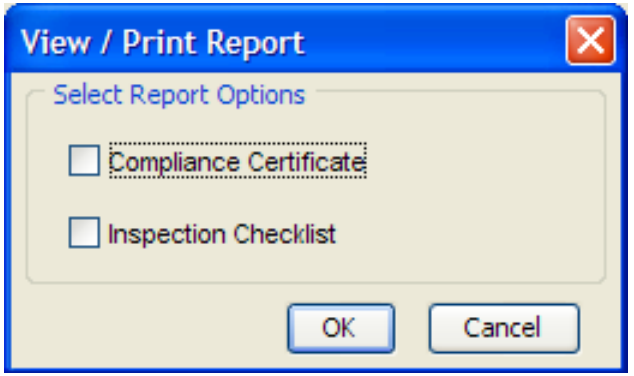
Compliance Report

- Project complies
- View/Print Report



Building Energy Codes Program

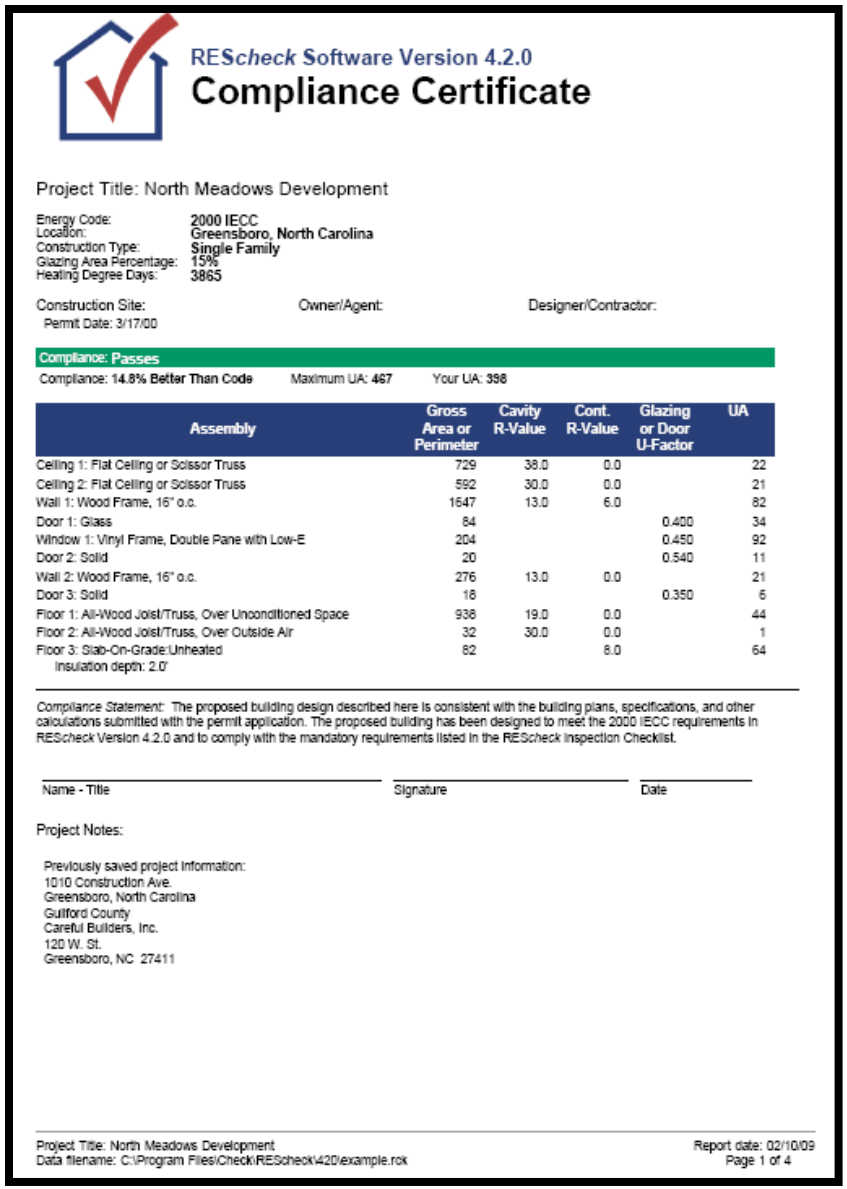
Compliance Report

Project Information

Building Components

Compliance Statement

Project Notes



RES*check* Software Version 4.2.0

Compliance Certificate

Project Title: North Meadows Development

Energy Code: 2000 IECC
Location: Greensboro, North Carolina
Construction Type: Single Family
Glazing Area Percentage: 15%
Heating Degree Days: 3865

Construction Site: Permit Date: 3/17/00 | Owner/Agent: | Designer/Contractor:

Compliance: Passes

Compliance: **14.8% Better Than Code** Maximum UA: **467** Your UA: **398**

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Glazing or Door U-Factor	UA
Ceiling 1: Flat Ceiling or Scissor Truss	729	38.0	0.0		22
Ceiling 2: Flat Ceiling or Scissor Truss	592	30.0	0.0		21
Wall 1: Wood Frame, 16" o.c.	1647	13.0	6.0		82
Door 1: Glass	84			0.400	34
Window 1: Vinyl Frame, Double Pane with Low-E	204			0.450	92
Door 2: Solid	20			0.540	11
Wall 2: Wood Frame, 16" o.c.	276	13.0	0.0		21
Door 3: Solid	18			0.350	6
Floor 1: All-Wood Joist/Truss, Over Unconditioned Space	936	19.0	0.0		44
Floor 2: All-Wood Joist/Truss, Over Outside Air	32	30.0	0.0		1
Floor 3: Slab-On-Grade:Unheated Insulation depth: 2.0'	82		8.0		64

Compliance Statement: The proposed building design described here is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the 2000 IECC requirements in REScheck Version 4.2.0 and to comply with the mandatory requirements listed in the REScheck Inspection Checklist.

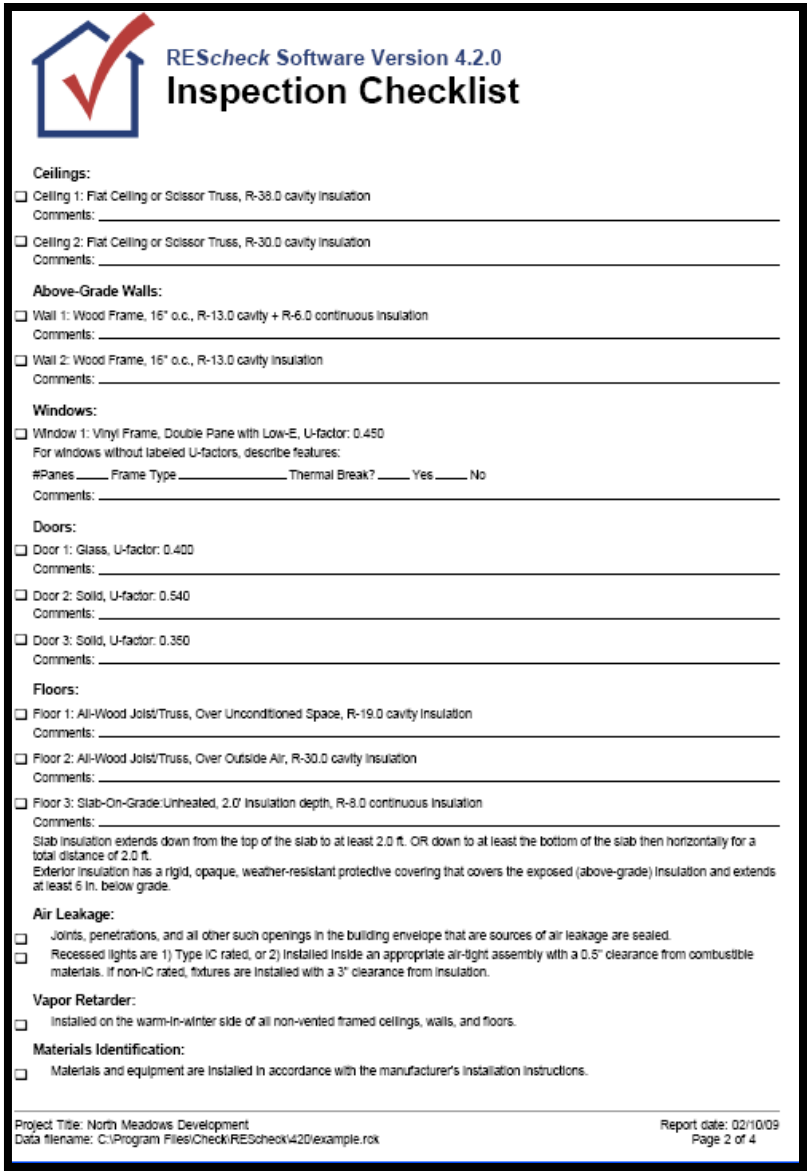
Name - Title | Signature | Date

Project Notes:

Previously saved project information:
1010 Construction Ave.
Greensboro, North Carolina
Guilford County
Careful Builders, Inc.
120 W. St.
Greensboro, NC 27411

Inspection Checklist

- Mandatory requirements
  - Code presumes these requirements are met



RES*check* Software Version 4.2.0

Inspection Checklist

Ceilings:

❑ Ceiling 1: Flat Ceiling or Scissor Truss, R-38.0 cavity insulation
Comments: _____

❑ Ceiling 2: Flat Ceiling or Scissor Truss, R-30.0 cavity insulation
Comments: _____

Above-Grade Walls:

❑ Wall 1: Wood Frame, 16" o.c., R-13.0 cavity + R-6.0 continuous insulation
Comments: _____

❑ Wall 2: Wood Frame, 16" o.c., R-13.0 cavity insulation
Comments: _____

Windows:

❑ Window 1: Vinyl Frame, Double Pane with Low-E, U-factor: 0.450
For windows without labeled U-factors, describe features:
#Panes ____ Frame Type _____ Thermal Break? ____ Yes ____ No
Comments: _____

Doors:

❑ Door 1: Glass, U-factor: 0.400
Comments: _____

❑ Door 2: Solid, U-factor: 0.540
Comments: _____

❑ Door 3: Solid, U-factor: 0.350
Comments: _____

Floors:

❑ Floor 1: All-Wood Joist/Truss, Over Unconditioned Space, R-19.0 cavity insulation
Comments: _____

❑ Floor 2: All-Wood Joist/Truss, Over Outside Air, R-30.0 cavity insulation
Comments: _____

❑ Floor 3: Slab-On-Grade:Unheated, 2.0' insulation depth, R-8.0 continuous insulation
Comments: _____
Slab insulation extends down from the top of the slab to at least 2.0 ft. OR down to at least the bottom of the slab then horizontally for a total distance of 2.0 ft.
Exterior insulation has a rigid, opaque, weather-resistant protective covering that covers the exposed (above-grade) insulation and extends at least 6 in. below grade.

Air Leakage:

❑ Joints, penetrations, and all other such openings in the building envelope that are sources of air leakage are sealed.

❑ Recessed lights are 1) Type IC rated, or 2) Installed inside an appropriate air-tight assembly with a 0.5" clearance from combustible materials. If non-IC rated, fixtures are installed with a 3" clearance from insulation.

Vapor Retarder:

❑ Installed on the warm-in-winter side of all non-vented framed ceilings, walls, and floors.

Materials Identification:

❑ Materials and equipment are installed in accordance with the manufacturer's installation instructions.

Project Title: North Meadows Development
Data filename: C:\Program Files\Check\REScheck\420\example.rck

Report date: 02/10/09
Page 2 of 4

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Mandatory Requirements

- Moisture control
- Air leakage
- Building mechanical systems and equipment
- Service water heating
- Duct construction and insulation

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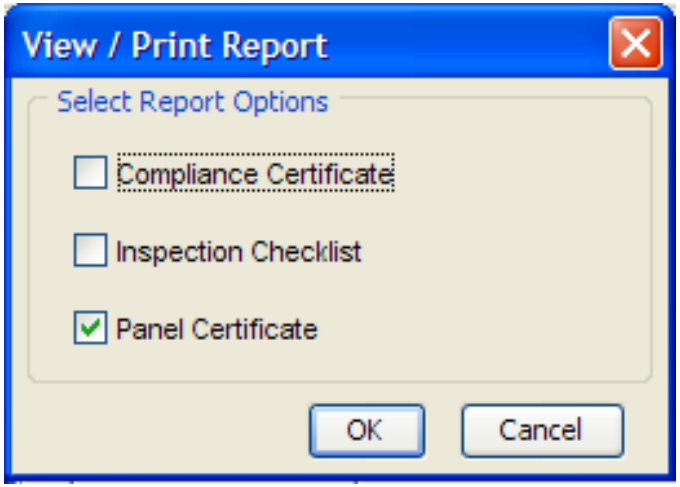
Panel Certificate

- Under 2006 IECC-based codes, panel certificate option



2006 IECC Energy Efficiency Certificate

Insulation Rating	R-Value
Ceiling / Roof	38.00
Wall	19.00
Floor / Foundation	19.00
Ductwork (unconditioned spaces):	____

Glass & Door Rating	U-Factor	SHGC
Window	0.45	0.35
Door	0.40	0.25

Heating & Cooling Equipment	Efficiency
Water Heater: _____	_____

Name: _____ Date: _____

Comments:

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Files

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

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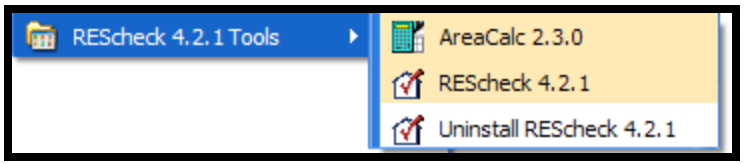
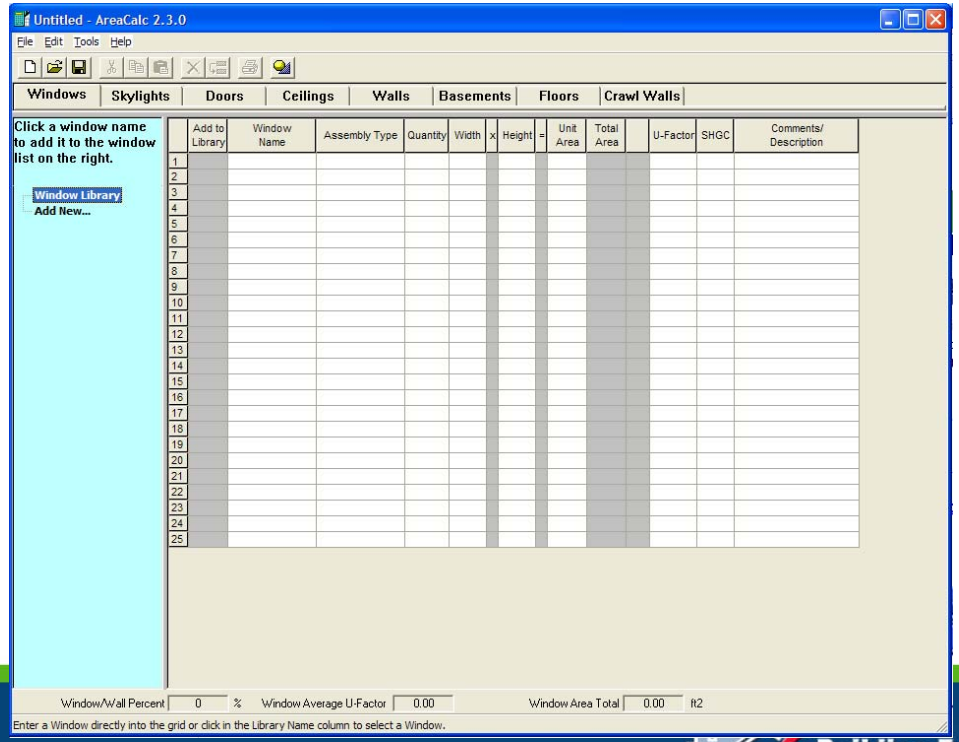
AreaCalc



- RES*check* desktop
- Calculates building areas
- Areas can be transferred into RES*check*



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Common Questions

- Additions
- Cavity vs. continuous insulation
- SHGC and U-factor values

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Additions

- Check with local jurisdiction
  - Addition only
  - Addition plus existing home
- Under 2006 IECC, select *Addition/ Alteration* as the project type

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Cavity vs. Continuous

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SHGC and U-Factors

NFRC
National Fenestration Rating Council®
CERTIFIED

World's Best Window Co.

Millennium 2000+
Vinyl-Clad Wood Frame
Double Glazing • Argon Fill • Low E
Product Type: **Vertical Slider**

ENERGY PERFORMANCE RATINGS

U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
0.35	**0.32**

ADDITIONAL PERFORMANCE RATINGS

Visible Transmittance	Air Leakage (U.S./I-P)
0.51	**0.2**
Condensation Resistance	
51	**—**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole-product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information.
www.nfrc.org

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COM*check* Basics

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COM*check*™

Desktop Software Tools

COMcheck™

Windows version or Mac version

Web-Based Tools

COMcheck•Web™

COMcheck™ Package Generator

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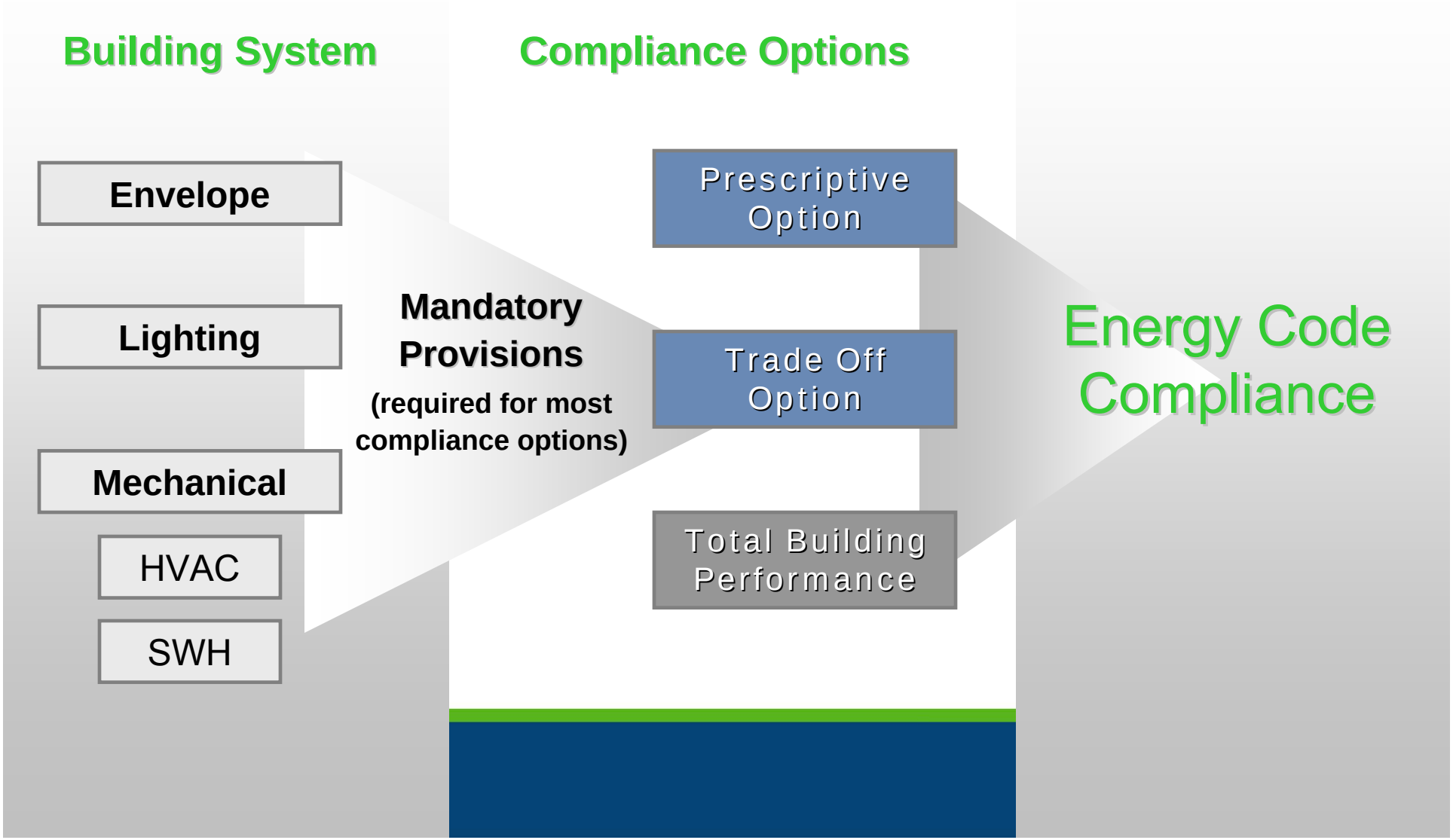
Commercial Compliance



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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

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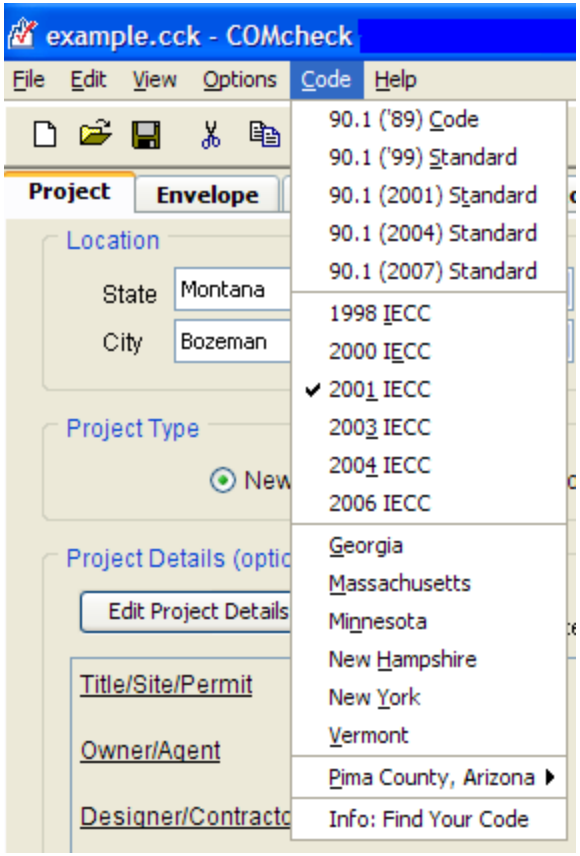
Appropriate Code

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



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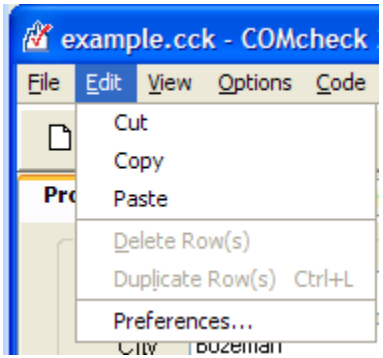
Preferences

- 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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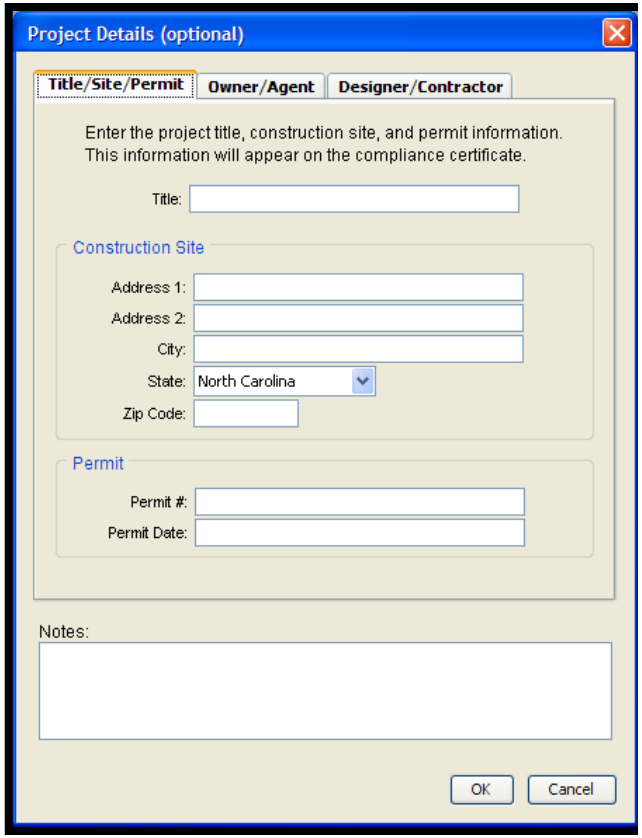
Project Information

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



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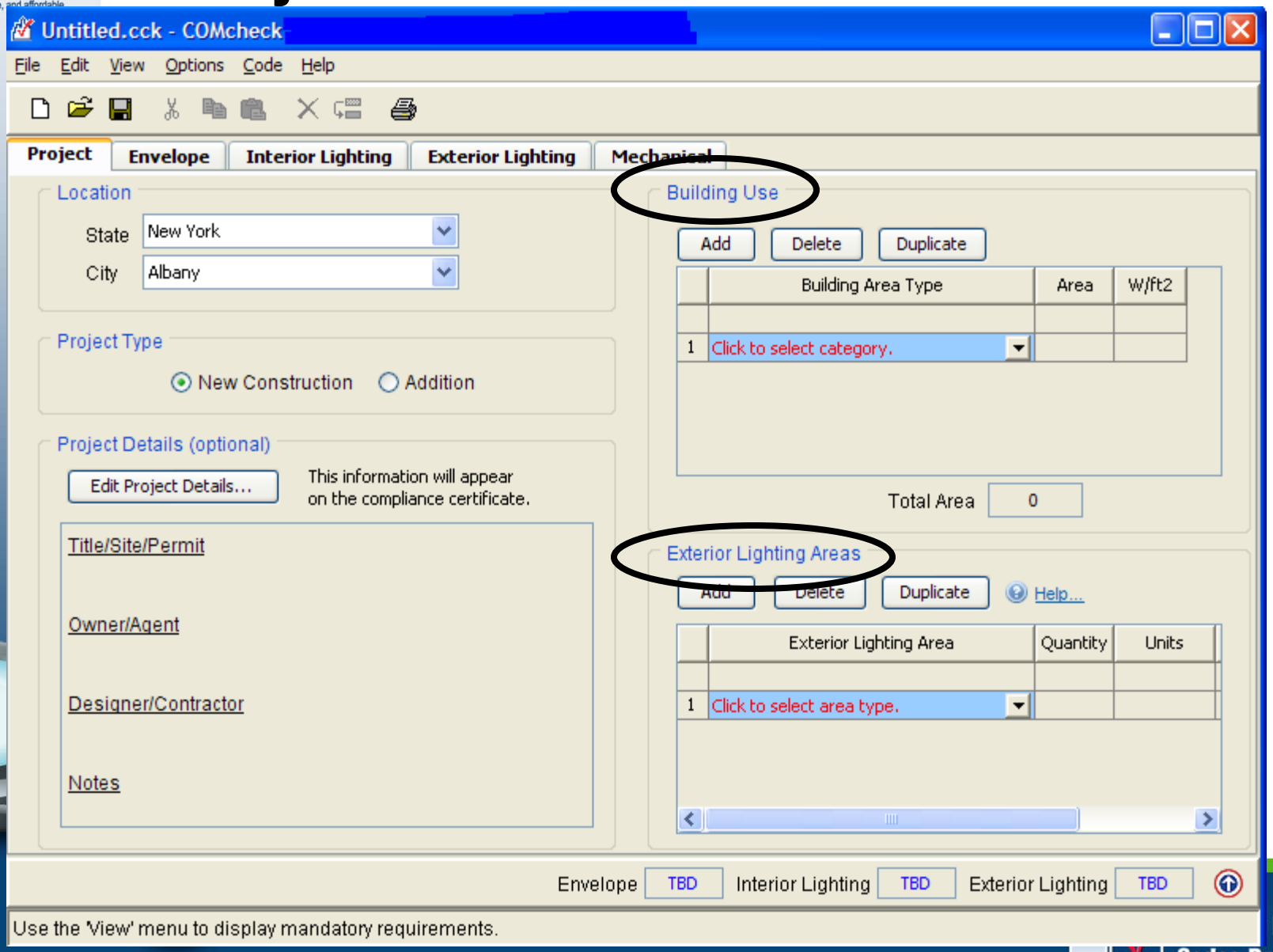
Project Screen



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Building Use Types

- Vary by code
- Internal loads
- Lighting power allowances

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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

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Foundations

- Basement button – use if
  - basement is conditioned
  - basement walls are insulated
- Floor button – use if
  - separates conditioned from unconditioned space (includes slab-on-grade floor)

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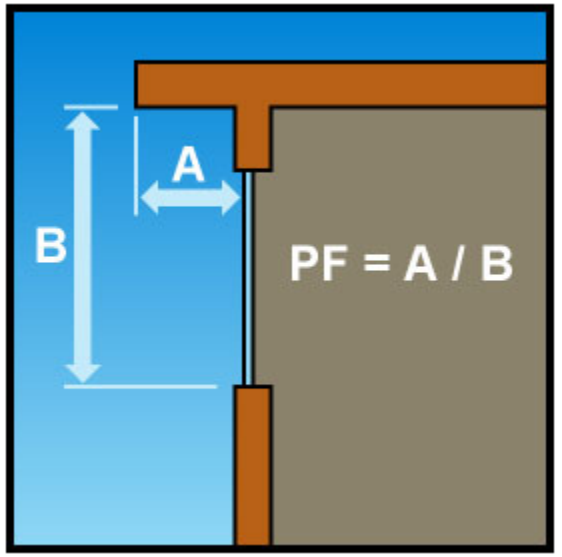
Envelope Screen

- 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	---	---	0.600	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	---	---

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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

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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)

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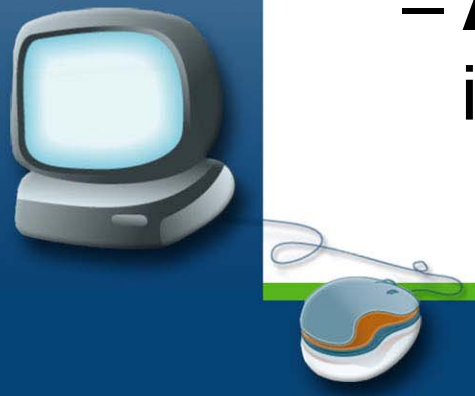
Exemptions and Allowances

- 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

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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:

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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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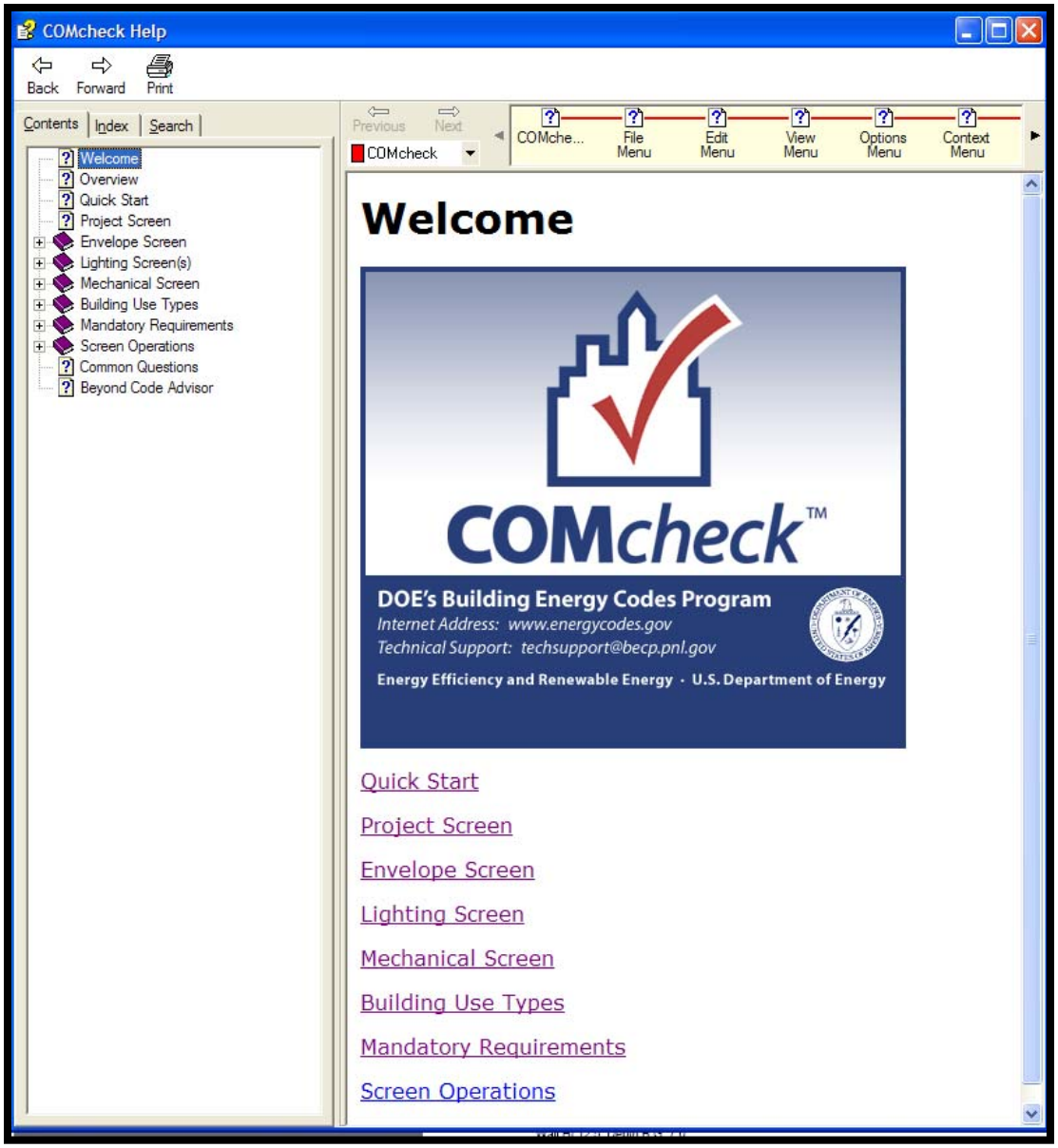
Help



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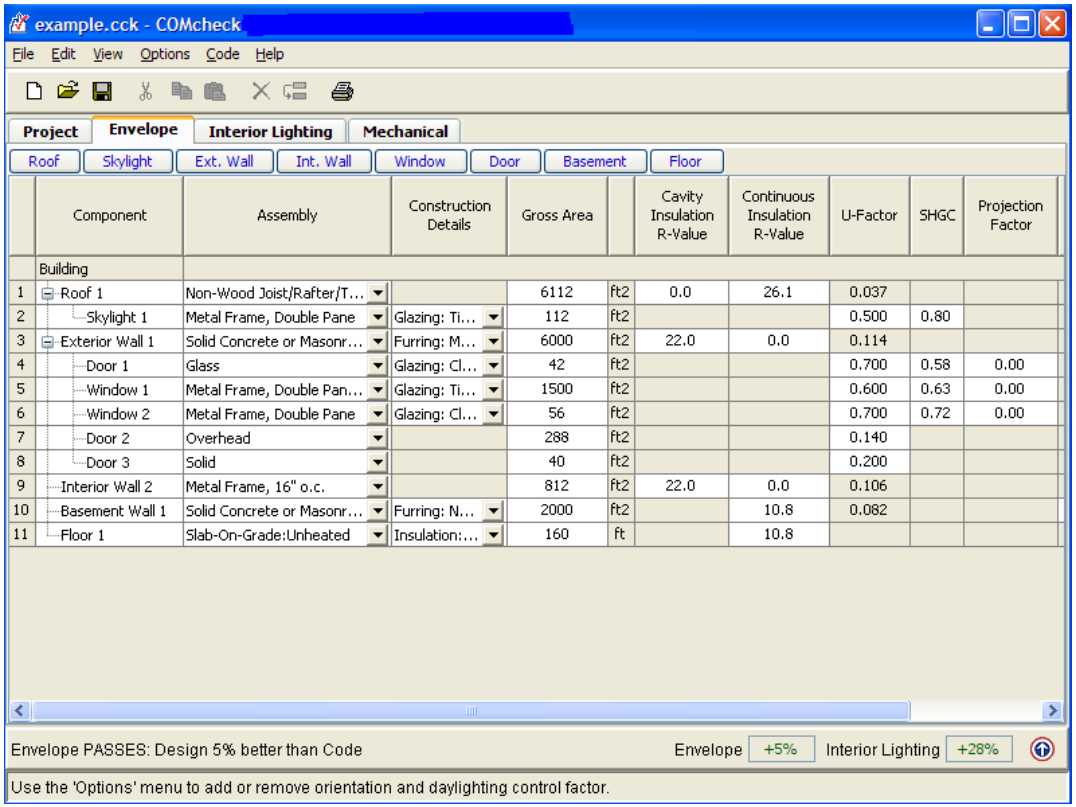
Screen Operations



Compliance Bar →

Status Bar →

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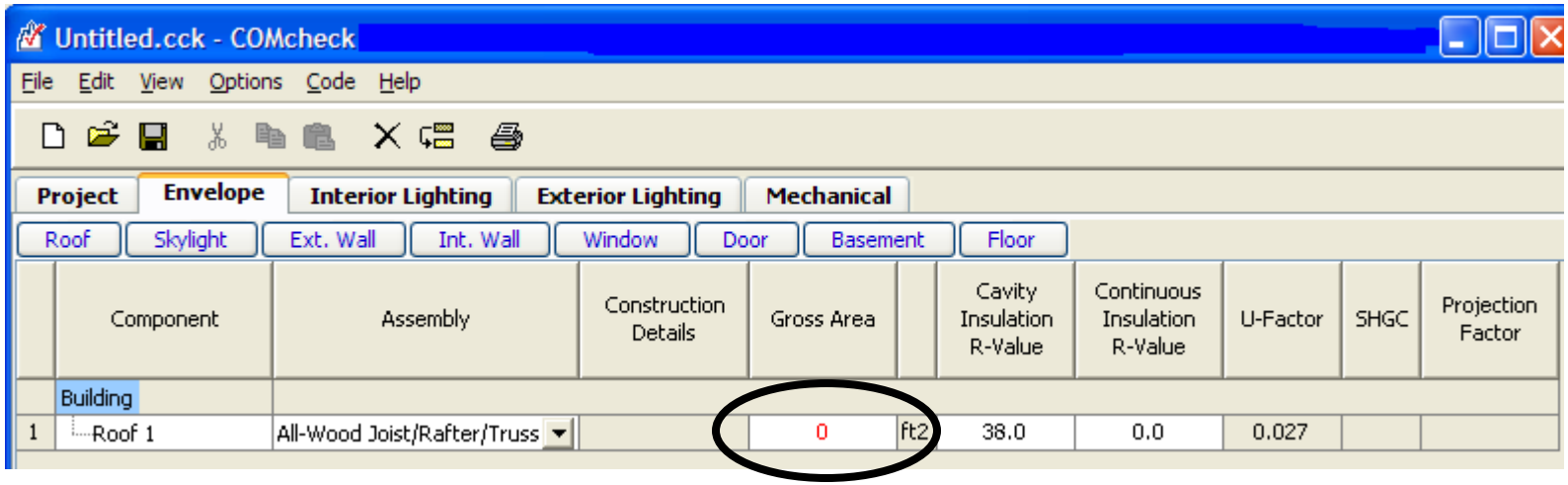
Screen Operations

- Compliance Bar
- Status Bar
- Colors - Red



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Screen Operations

- Compliance Bar
- Status Bar
- Colors - Green

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Screen Operations

- Compliance Bar
- Status Bar
- Colors - Blue

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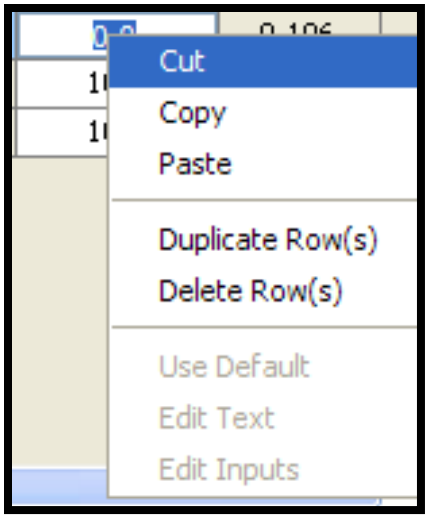
Screen Operations

- 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

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