



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



Building Energy Codes

Alterations Feature in COMcheck

U.S. Department of Energy
Building Energy Codes Program

www.energycodes.gov techsupport@becp.pnl.gov

Building Energy Codes Program



About the Program

Compliance Tools

- Residential (REScheck)
- Commercial (COMcheck)
- On-line Compliance Tools
- Federal Building Codes - Commercial

Training/Education

- Residential Training
- Commercial Training
- Events Calendar
- Energy Codes Glossary
- Annual Workshop

Implementation Tools

- Resource Center
- DOE 2004 Proposals
- DOE Determinations
- DOE Assistance
- Resource Materials
- Status of State Energy Codes
- Setting the Standard

Technical Support

- Code Notes

Related Links

[XML](#) [RSS](#)
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DOE'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



REScheck

[REScheck](#), [REScheck-Web](#), [REScheck Package Generator](#)



COMcheck

[COMcheck](#), [COMcheck-Web](#), [COMcheck Package Generator](#)

Technical Support



Resource Center

[Resource Center](#)



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NEWS

Statement of the Department of Energy - State Energy Code Criteria for Residential AC and HP

[2005 ICC Final Action Hearings](#)

[New Release! REScheck Software - Desktop and Web](#)

New Release COMcheck Software! Desktop and Web (Includes 90.1-2004)

Commercial Compliance Tools

Desktop Software Tools



Web-Based Tools



Free

Printed Materials

Compliance Guides

Prescriptive Tables



When does COMcheck apply?

Commercial New Construction, Alterations and Additions

- Commercial Buildings include all buildings except
 - Single family
 - Low rise multi-family < 3 stories in height

- State Dependent
 - Not all states have the same code, some states have state-specific energy codes
 - Check to see what code is applicable in your state and if *COMcheck* is accepted
 - [Status of State Codes](#)
 - http://www.energycodes.gov/implement/state_codes/index.stm

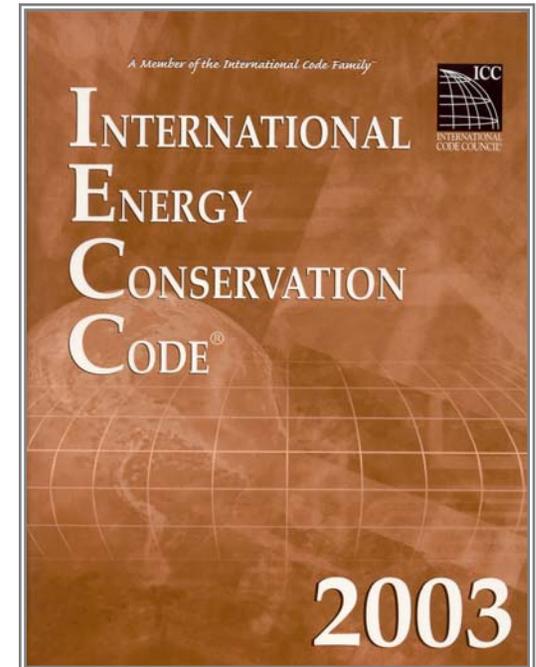
Alterations and the Energy Code

- Alterations/Renovations/Remodels are covered in major energy codes
 - IECC since 2000
 - ASHRAE 90.1 since 1999
- Historically, energy code compliance has been focused on new construction
- Application and Enforcement depends on local or State Code officials



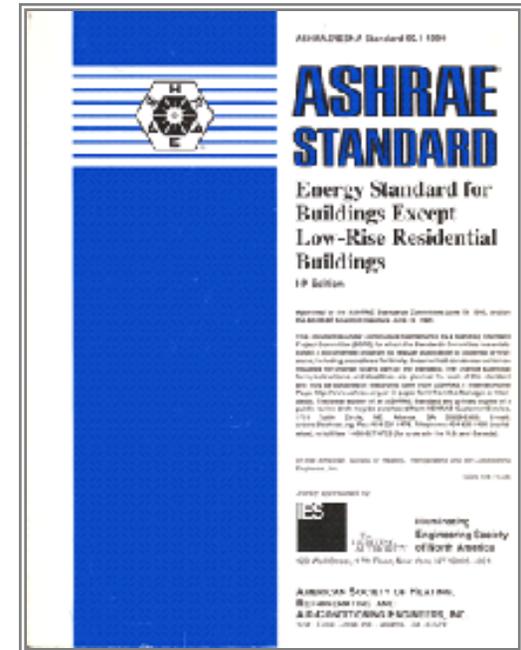
IECC Requirements

- 2000, 2003 – Altered components must meet new construction requirements
- 2004 – Same requirement but with exceptions noted for:
 - Storm windows
 - Glazing only replacement
 - Insulation cavities that are not exposed or are already filled.



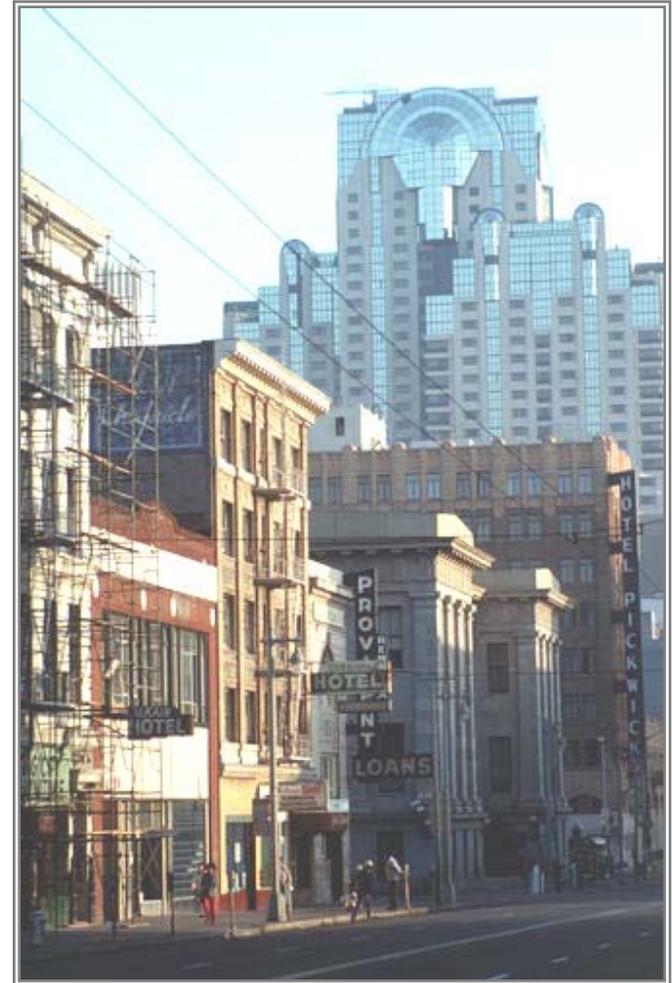
ASHRAE 90.1 Requirements

- 1999 - 2004 versions – Altered components must meet new construction requirements
 - ... but with various exceptions for:
 - Envelope
 - HVAC
 - Water Heating
 - Lighting
- Applies to affected components only!
- Cosmetic treatments do not need to be considered....unless they expose energy components
- Allows energy trade-off compliance method in addition to prescriptive



90.1 – Envelope Exceptions

- Storm windows
- Glazing replacement only (= U/SHGC)
- Window replacement (< 25% and = U/SHGC)
- Insulation cavity already filled (R=3/inch) or unexposed
- Roof membrane only or below deck insulation
- Vestibule requirements not applicable on door replacement



90.1 HVAC/SWH Exceptions

- Equipment modification or repair only (no increase in energy)
- Where compliance requires extensive revision to other systems
- Refrigerant change only
- Relocation only
- Water Heaters, Ductwork, and Piping – where there is insufficient clearance



90.1 Lighting Exception

- Replacement of less than 50% of luminaires in a “space”but must not increase energy use.

Note: replacement of luminaire components only (lamp, ballast) does not constitute an alteration for compliance purposes.





COMcheck™

DOE's Building Energy Codes Program

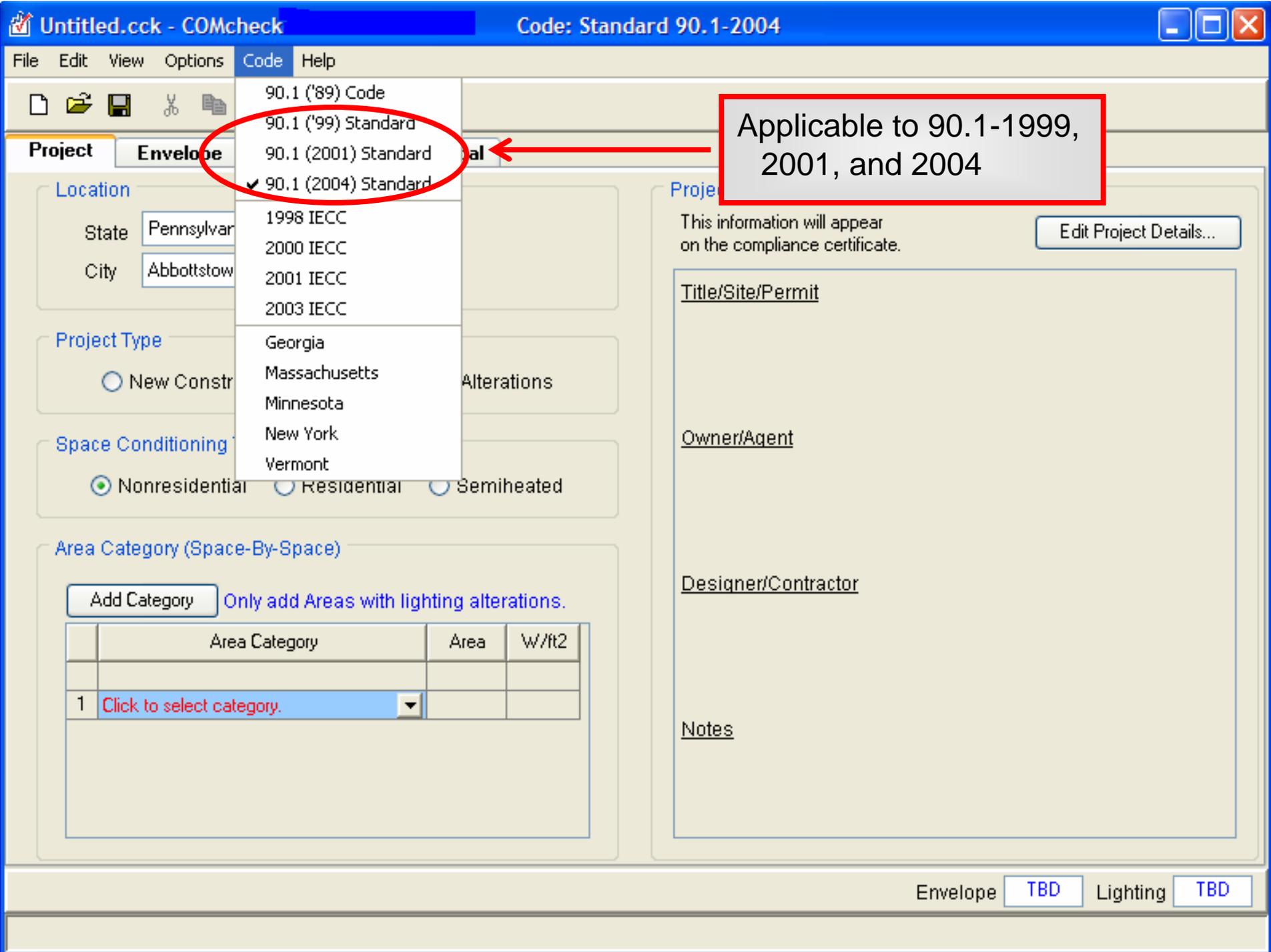
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Untitled.cck - COMcheck Code: Standard 90.1-2004

File Edit View Options Code Help

Project Envelope Lighting Mechanical

Location

State Pennsylvania

City Abbottstown

Project Type

New Construction Addition Alterations

Space Conditioning Type

Nonresidential Residential Semiheated

Area Category (Space-By-Space)

Add Category Only add Areas with lighting alterations.

	Area Category	Area	W/ft2
1	Click to select category.		

Project Details (optional)

This information will appear on the compliance certificate. Edit Project Details...

Title/Site/Permit

Owner/Agent

Designer/Contractor

Notes

Envelope TBD Lighting TBD

Choose the state in which the building will be located.



Location

State

City

Project Type

New Construction Addition Alterations

Space Conditioning Type

Nonresidential Residential Semiheated

Area Category (Space-By-Space)

Only add Areas with lighting alterations.

	Area Category	Area	sq/ft2
1	<input type="text" value="Click to select category."/>		

Project Details (optional)

This information will appear on the compliance certificate.

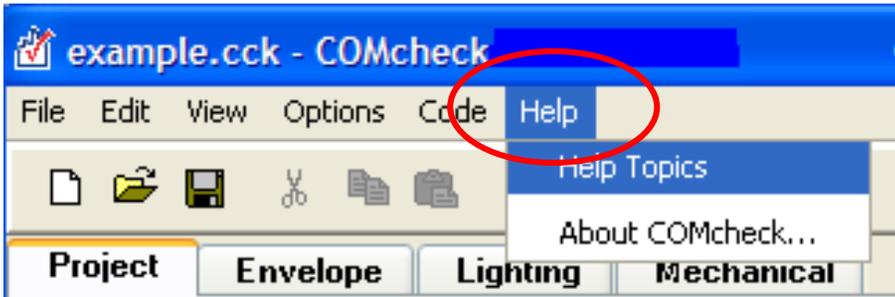
Title/Site/Permit

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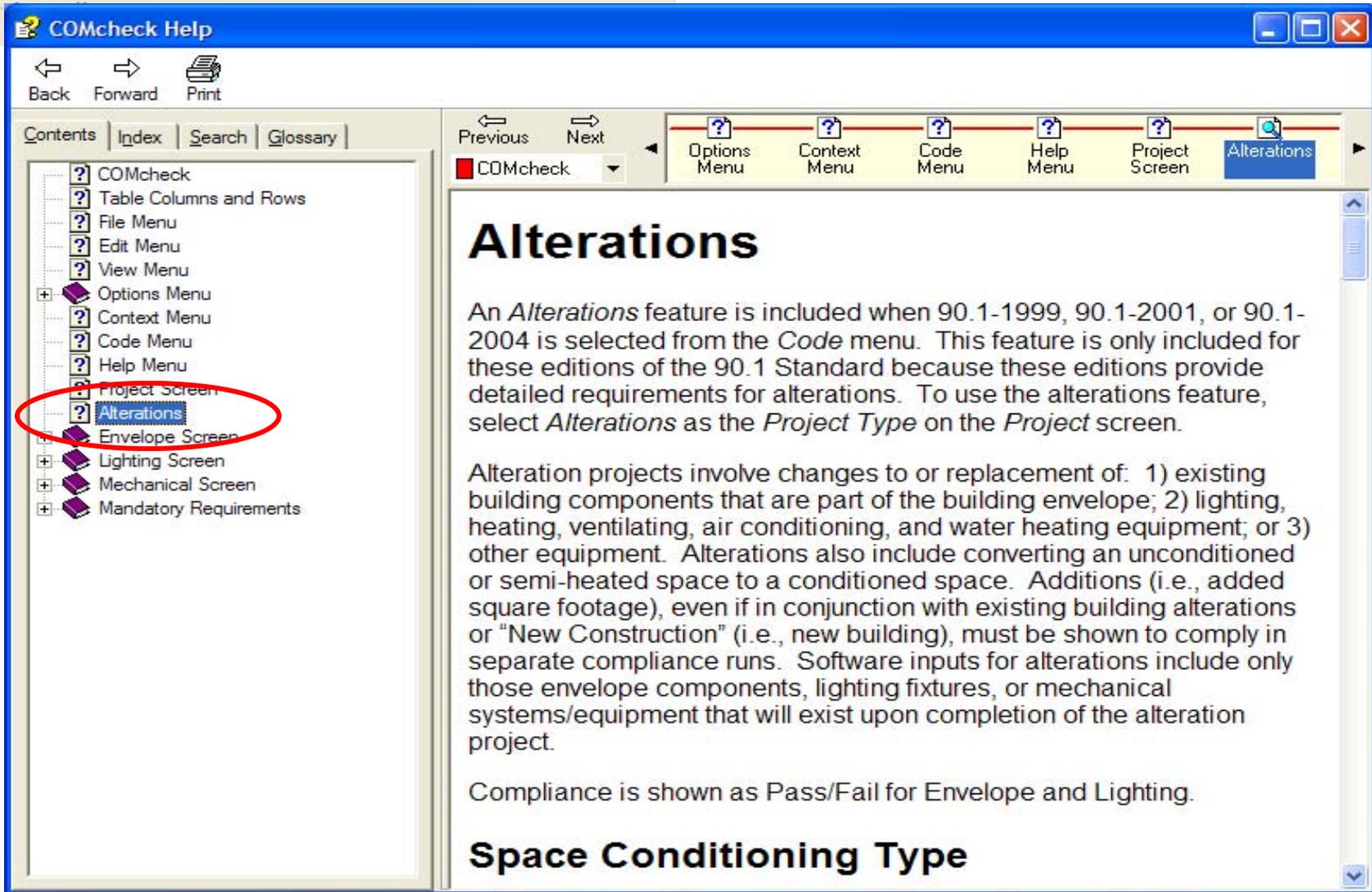
Designer/Contractor

Notes

Area Categories:
Use if LIGHTING is being altered ONLY



Need Help?



Alteration Example

- Space Conditioning: Nonresidential
- Envelope:
 - Roof: Attic roof with Steel Joists = cavity insulation R3/inch
 - Skylights: replace all existing skylights (<2% skylight/roof%)
 - U-factor = 0.660 SHGC = 0.35
 - Exterior walls – Steel-framed, 24" o.c.
 - R-value = 13 cavity insulation
 - Vertical Glazing: 20% replaced
 - Pre-Alteration: Metal-Frame Single Pane, U-factor = 1.250, SHGC = 0.82
 - Post alteration: Vinyl frame-double pane low e, U-factor = 0.33, SHGC = 0.35
- Mechanical: service repairs to Rooftop Package Units

Alteration Example

➤ Area Categories (Lighting Alteration only):

● **Hotel/Motel: Hotel Lobby 3,000 sq. ft.**

- Metal Halide 75W, 1 lamp/fixture, electronic, 50 fixtures, fixture wattage = 80
- Compact Fluorescent, twin tube 13W, electronic, 1 lamp/fixture, 14 fixtures, fixture wattage = 15
- Chandeliers – 4, 8 lamps/fixture, fixture wattage 200, decorative allowance (1,000 sq. ft. floor area)

● **Hotel/Motel: Hotel Dining Area 15,000 sq. ft.**

- 48" T8 28W Super T8, electronic, 3 lamps/fixture, 32 fixtures, fixture wattage = 82
- Compact Fluorescent, twin tube 18W, electronic, 2 lamps/fixture, 328 fixtures, fixture wattage = 38
- Metal Halide 100W, electronic, 1 lamp/fixture, 30 fixtures, fixture wattage = 105

● **Hotel/Motel: Guest Rooms 20,000 sq. ft.**

- Exempt: <50% of fixtures replaced and no increase in energy use.

● **Corridor/Hallways 2,000 sq. ft.**

- 24" TIU 32W, 2 lamps/fixture, 8 fixtures, fixture wattage = 62
- Compact Fluorescent, twin tube 13W, electronic, 1 lamp/fixture, 27 fixtures, fixture wattage = 15