



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



Building Energy Codes

How to Use *COMcheck* *Energy Code Compliance Software*

U.S. Department of Energy
Building Energy Codes Program

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www.energycodes.gov
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DOE: Building Energy Codes - Home - Windows Internet Explorer

http://www.energycodes.gov/

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DOE: Building Energy Codes - Home

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EERE Home

Building Energy Codes Program



Search energycodes.gov

Search

About the Program

- Program Highlights
- Press

Compliance Tools

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

Training/Education

- Recorded Webcasts
- Self-Paced
- Presentations
- Events Calendar
- Energy Codes Glossary
- Energy Codes 2008

 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

Site Map
Need Help? -
Ask an Energy Codes Expert
(Software Tools and Energy Codes Assistance)

EERE Information Center

Printer Friendly Format

NEWS

Energy Codes 2008
July 22-25, 2008
[Register Now!](#)

Three-Part Series on Advanced Energy Design Guide Recommendations

Advanced Energy Design Guides (AEDG)
Downloads Now Available

Internet 100%

BECP Commercial Code Compliance Tools

Prescriptive Approach

- Simple, fast and easy
- Generally most stringent
- Requires minimum input
- Based on climate and WWR
- Uses a prototype building

1 Printed guides on www.energycodes.gov



Trade-off Approach

- Trade-off between components
- Provides design flexibility
- Requires area & U/R-factors

Free

Windows version or
Mac version

1



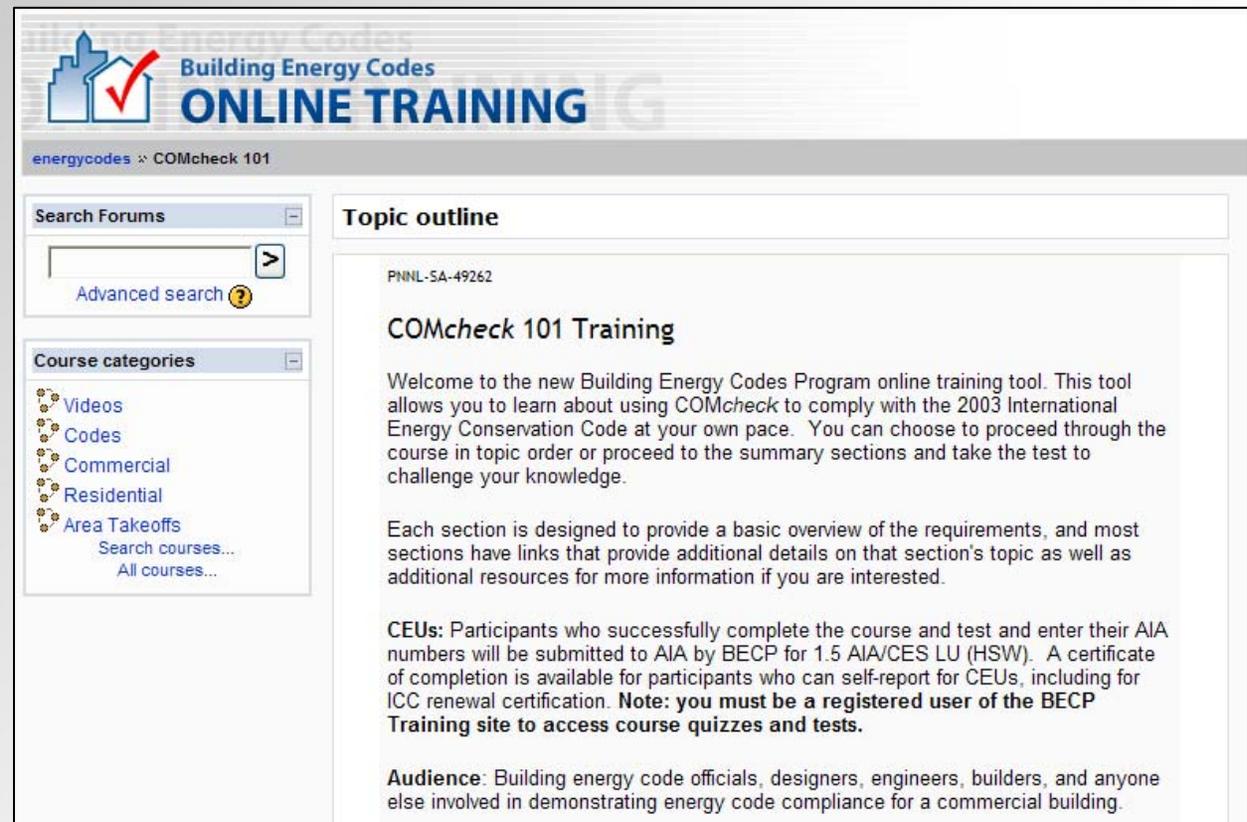
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All COMcheck tools available from www.energycodes.gov

Training Tools

- PowerPoint presentations with faculty notes
- Case studies
- Online training
- Online videos



The screenshot displays the 'Building Energy Codes ONLINE TRAINING' website. The header features a logo with a house and a checkmark, and the text 'Building Energy Codes ONLINE TRAINING'. Below the header, the breadcrumb 'energycodes > COMcheck 101' is visible. The left sidebar contains a 'Search Forums' section with a search box and an 'Advanced search' link, and a 'Course categories' section with a tree view including 'Videos', 'Codes', 'Commercial', 'Residential', 'Area Takeoffs', 'Search courses...', and 'All courses...'. The main content area is titled 'Topic outline' and includes the identifier 'PNNL-SA-49262'. The primary heading is 'COMcheck 101 Training', followed by a welcome message: 'Welcome to the new Building Energy Codes Program online training tool. This tool allows you to learn about using COMcheck to comply with the 2003 International Energy Conservation Code at your own pace. You can choose to proceed through the course in topic order or proceed to the summary sections and take the test to challenge your knowledge.' Below this is a paragraph stating: 'Each section is designed to provide a basic overview of the requirements, and most sections have links that provide additional details on that section's topic as well as additional resources for more information if you are interested.' The next section is 'CEUs: Participants who successfully complete the course and test and enter their AIA numbers will be submitted to AIA by BECP for 1.5 AIA/CES LU (HSW). A certificate of completion is available for participants who can self-report for CEUs, including for ICC renewal certification. **Note: you must be a registered user of the BECP Training site to access course quizzes and tests.**' The final section is 'Audience: Building energy code officials, designers, engineers, builders, and anyone else involved in demonstrating energy code compliance for a commercial building.'

Welcome to the Building Energy Codes Resource Center



This system has been developed to provide users with information about energy codes and beyond code technologies. You can SEARCH by keyword, or BROWSE the available topics. Start your research using the toolbar at the top of the page.

Resources are available in a variety of different media types, including Articles, Graphics, Online Tools, Presentations, and Videos. The BECP Resource Center gathers content not only from our own archives, but also provides links to energy code resources from around the web. [Learn more about the Resource Center.](#)

NEW MATERIALS

[Article #1529: Energy Policy Act 2005 and Tax Credits](#)

[Article #1533: Appropriate Use of Building Energy Simulation Software](#)

[Article #1484: Vestibule Case Study](#)

POPULAR RESOURCES

[Article #139: Insulating Suspended Ceilings](#)

[Building Energy Codes Glossary](#)

[Article #1420: Energy Code Climate Zones](#)

[Article #1469: How Do I Enter Non-Uniformly Insulated Basement Walls in REScheck?](#)

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

Commercial Buildings

Building System

Envelope

Lighting

Mechanical

HVAC

SWH

Compliance Options

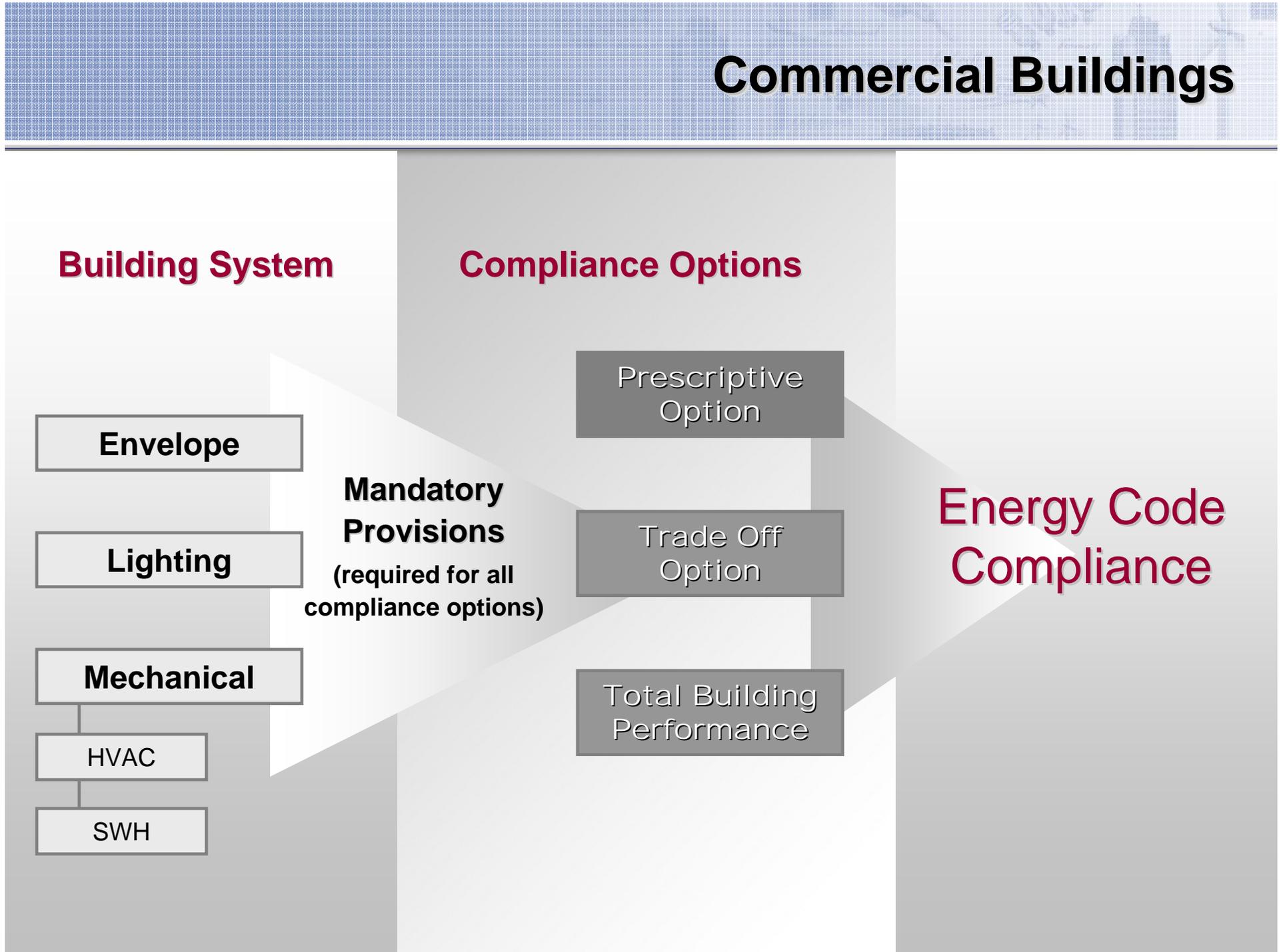
Prescriptive
Option

Trade Off
Option

Total Building
Performance

**Mandatory
Provisions**
(required for all
compliance options)

Energy Code Compliance



Components that Must Comply with the Energy Code

Building Envelope

- construction assembly (materials & insulation levels)
- windows, doors & skylights

Mechanical Systems

Service Water Heating

Lighting Systems



How do they correlate in *COMcheck*?
No trade-offs between systems!

Commercial Building Envelope Requirements

➤ Mandatory Requirements:

- Moisture Control
- Air Leakage

➤ Climate Specific Requirements:

- Roof
- Above Grade Walls
- Below Grade Walls
- Floor
- Slab
- Skylights, Windows, and Doors



Lighting Compliance

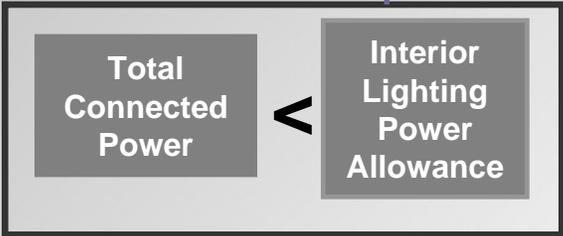
Mandatory Requirements (Interior and Exterior)

- Controls
- Switching
- Efficiency

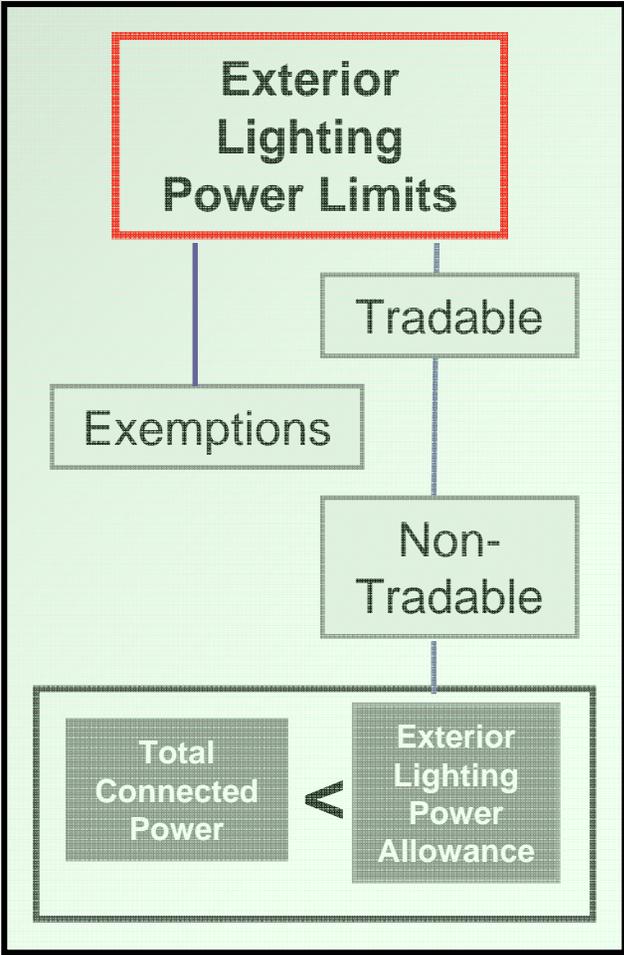
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Interior Lighting Power Limits

+



- Exemptions
- Whole Building
OR
Space-by-Space
- Additional Allowances



What is COMcheck?

➤ Envelope

- trade-off calculations are based on envelope loads only
- defines a proposed design and a budget design

➤ Lighting

- Watts/square foot (LPDs)

➤ Mechanical

- customize a list of requirements applicable to the systems identified

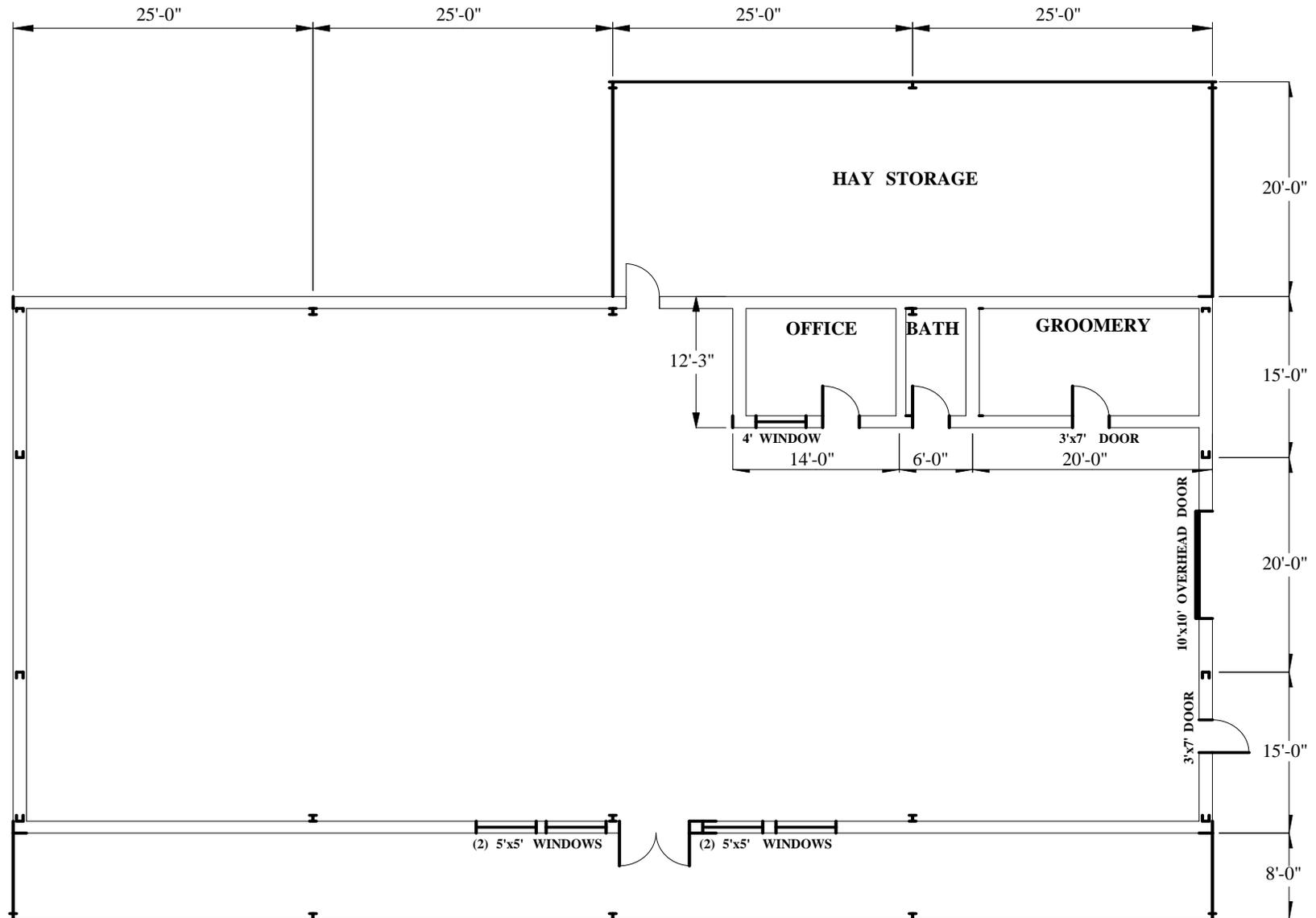
COMcheck Software Case Studies



Red Mountain Feed & Irrigation



Red Mountain Feed & Irrigation Floor Plan



Spaces

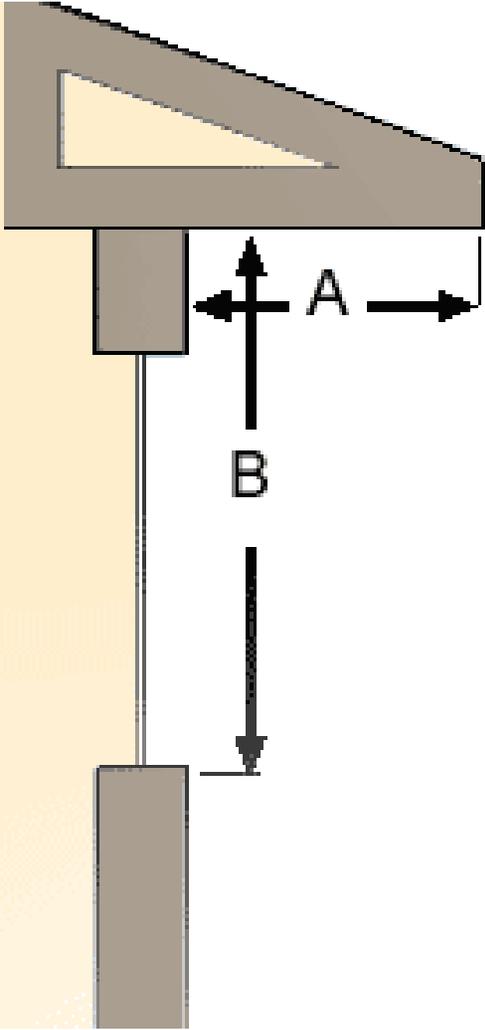


Inside Office/Bathroom

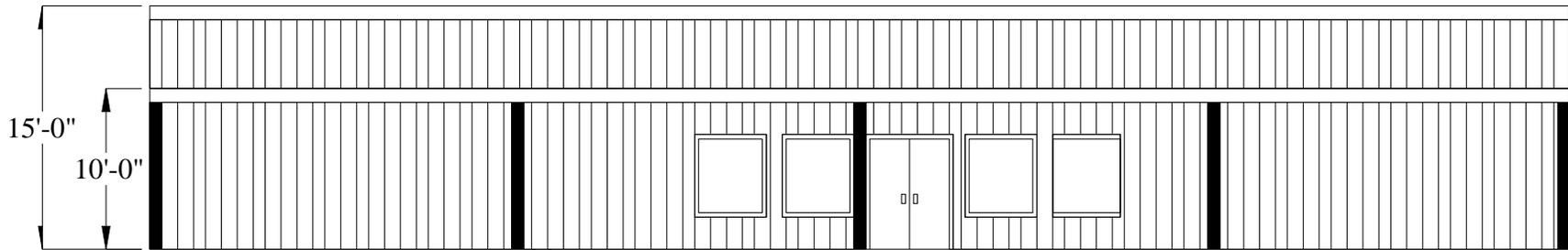


Storage

Overhang/Projection Factor (PF)

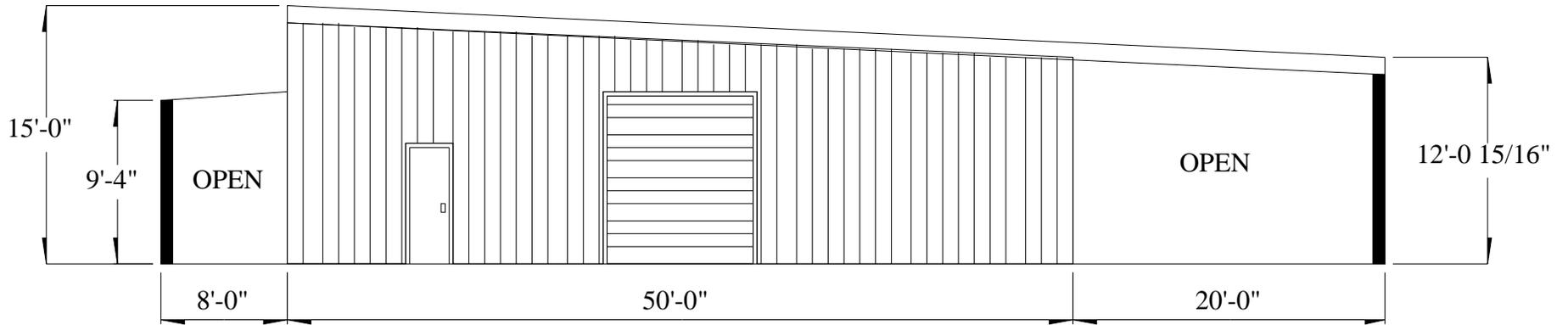


PF= A/B
PF=0.5



Exterior Walls: 3,954 sq.ft.

- 10' High: R10 between girt & metal wall + 2x4 R11 metal studs, 0.071 u-factor, heat capacity=1 (2,176 sq. ft.)
- 5' High: R10 between girt & metal wall (928 sq. ft.)



Walls



- **Red Mountain Feed Building Envelope**

Roof: 5,000 sq.ft. Metal w/1” Styrofoam thermal block, R-13 Insulation

Exterior Walls: 6,397 sq.ft.

Windows: 144 sq.ft. Metal Frame, double pane, tinted, U-factor .75, SHGC .88, PF .33

Glass Doors: 42 sq. ft., Metal Frame, U-factor .92, SHGC .87, PF, .33

Window/Wall Ratio = 2.9%

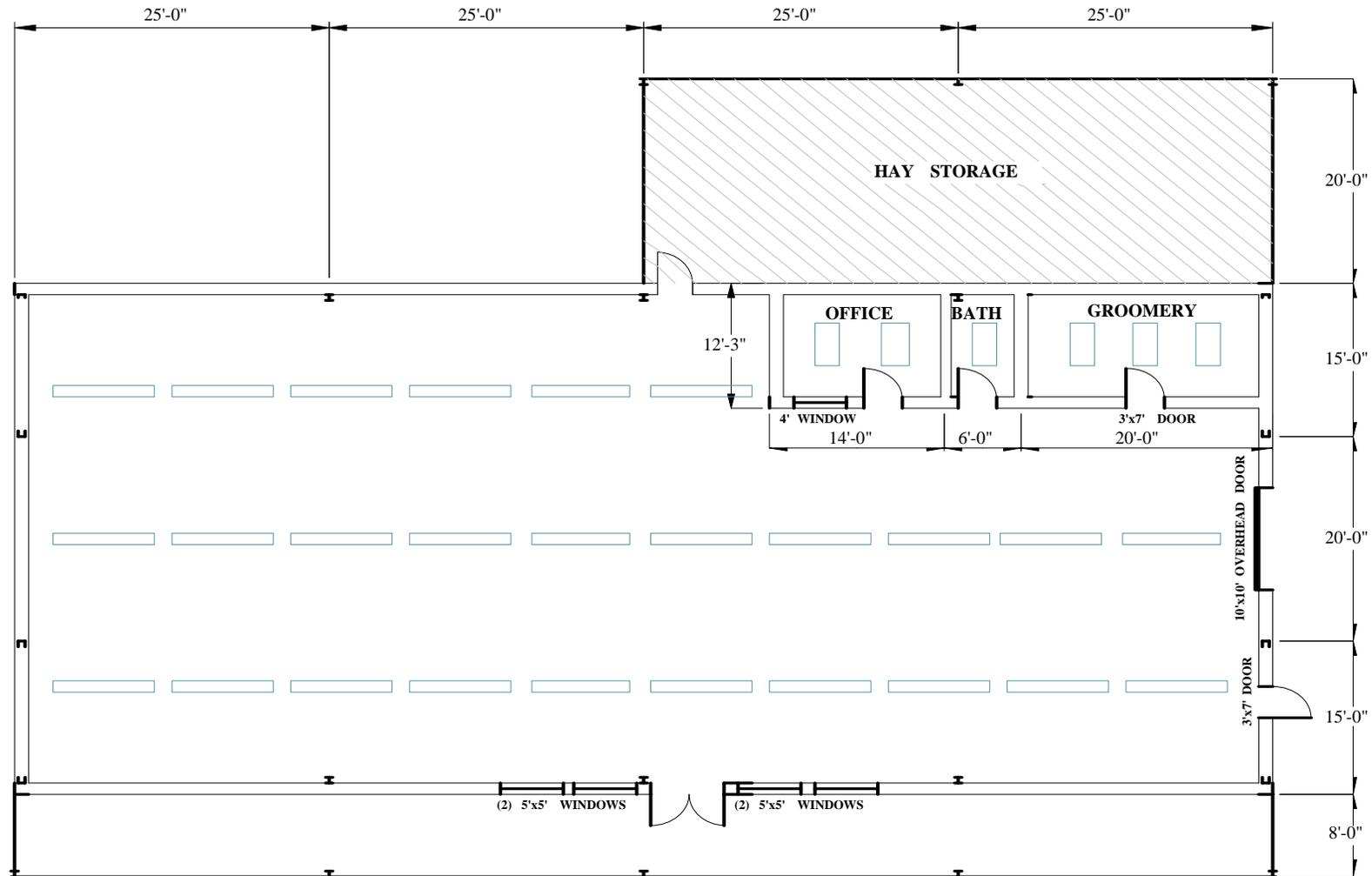
Doors: 100 sq. ft. Overhead Metal, U-value .60, other metal-42’, u-value 1.20

Floor: 5000sq.ft./300 linear feet, unheated slab on grade, R10 2’ vertical

Lighting



Red Mountain Feed Lighting Plan



Lighting Schedule

8' Industrial Fluorescent, 2 F96T12 Slimline Lamps & Energy Saving Magnetic Ballast

43 Fixtures, 173 watts/fixture

2'x4" Troffer 2 F32T8 lamps and GEB, 6 Fixtures, 59 watts/fixture

Heating System



Pellet Stove



Unit Heater

Questions/Comments

➤ Help Desk – on-line electronic form

<http://www.energycodes.gov/support/helpdesk.php>

➤ Email

Techsupport@becp.pnl.gov