

Using Energy Compliance Software

Presented by
Energy Systems Laboratory
Texas A&M University System

Sponsored by the
Texas State Energy Conservation Office



Case Study – COMcheck-EZ™ Software



Sigma 4 Office Building

Richland, WA



What is COMcheck-EZ™?

- COMcheck-EZ™ is a computer program that can be used to demonstrate Commercial Energy Code Compliance
- The Software is self-contained
 - Energy Code book can be used as needed for reference only
- Relatively simple to use and very flexible



What Do I Need to Know?

Information you need to use *COMcheck-EZ™*:

1. General Understanding of Windows-based Computer Programs
2. Basic Information about the Builder and Project to be Constructed
3. Building Plans including Exterior Wall Areas, Glazing Areas, Roof/Ceiling Areas, Basement Wall Areas, etc.
4. Insulation R-Values, NFRC Glazing and Door U-Values, etc.
5. Lighting
6. Heating and Cooling System Efficiencies
7. Service Water Heating



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



Microsoft Outlook
Software Analysis
Adobe Reader 6.0
ETP
Net for Broadband
Internet
Instant Messenger
Recovery...
Nero 7.0
Microsoft Word
Netscape Mail
@Takesy.m...
RealOne Player
Offline PopFon
Setup Inst...
VPN Setup

Recycle Bin

start

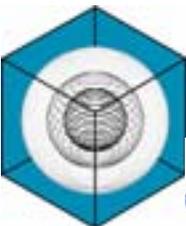
3:07 PM

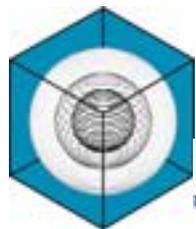
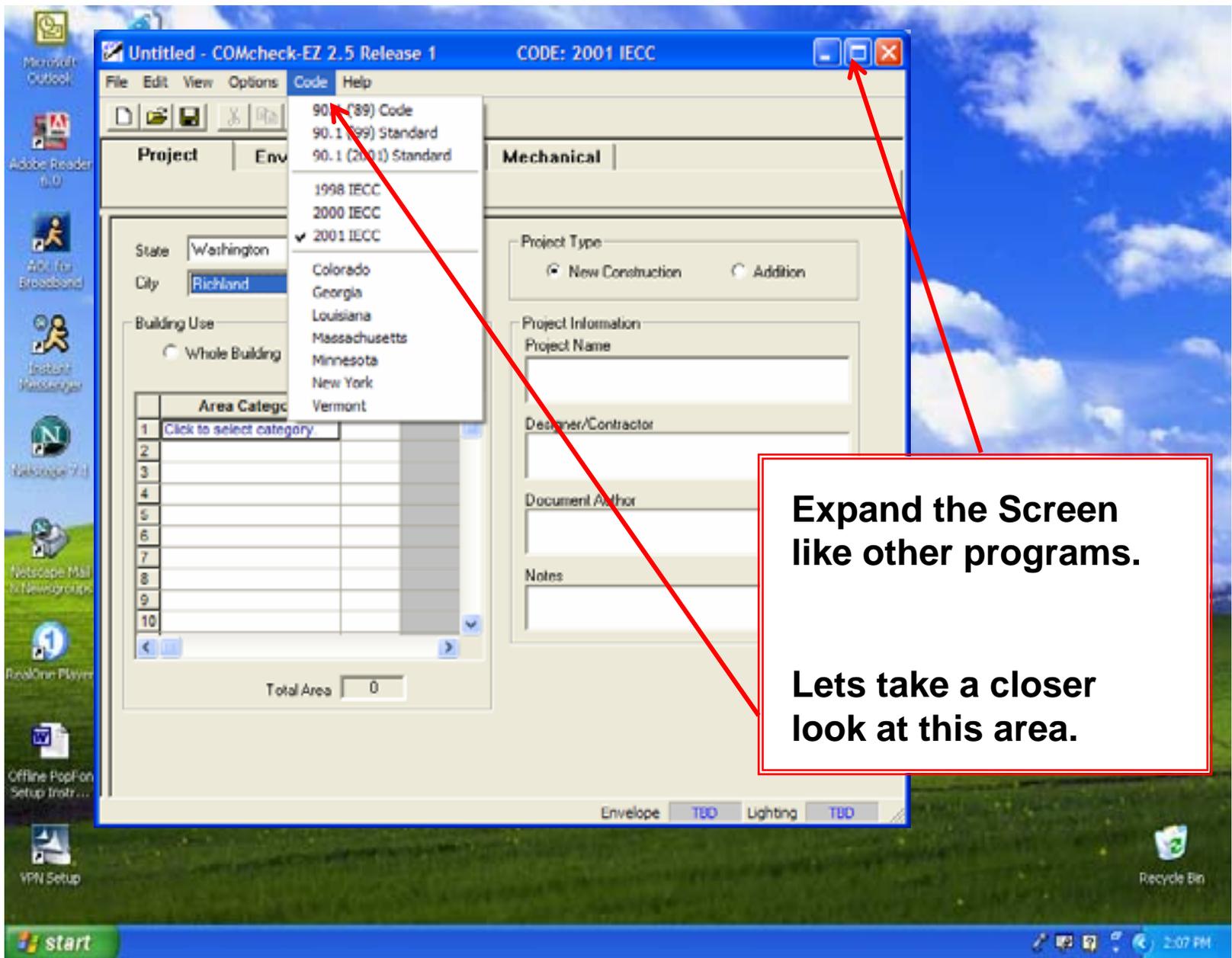
COMcheck-EZ™

DOE's Building Energy Codes Program
Internet Address: www.energycodes.gov
Technical Support: techsupport@becp.pnl.gov

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

OK





EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

90.1 (89) Code
90.1 (99) Standard
90.1 (2001) Standard
1998 IECC
2000 IECC
✓ 2001 IECC
Colorado
Georgia
Louisiana
Massachusetts
Minnesota
New York
Vermont

Project Env

State Washington
City Richland

Building Use
 Whole Building

	Area Category		
1	Office	15849	1.5
2	Corridor, Restroom, Suppor	3838	0.8
3	Kitchen	505	2.2
4	Lobby - Other	340	1.0
5			
6			
7			
8			
9			
10			

Total Area 20532

Mechanical

Project Type
 New Construction Addition

Project Information
Project Name
Sigma 4 Office Building
3170 George Washington Way

Designer/Contractor
Joe's Construction
George, Washington

Document Author
KRT

Notes
Existing construction major renovation with lightin design (existing fixturesand existing mechanical eq

Envelope +22% Lighting -10%

- Title Bar
- Menu Bar
- Toolbar
- Make sure the correct code is chosen.



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File Edit View Options Code Help

Project Envelope Lighting Mechanical

State: Washington
City: Richland

Building Use
 Whole Building Area Category

	Area Category	Area	W/ft2
1	Office	15849	1.5
2	Corridor, Restroom, Suppor	3838	0.8
3	Kitchen	505	2.2
4	Lobby - Other	340	1.0
5			
6			
7			
8			
9			
10			

Total Area: 20532

Project Type
 New Construction Addition

Project Information
Project Name: Sigma 4 Office Building
3170 George Washington Way

Designer/Contractor
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Notes
Existing construction major renovation with lightin design (existing fixturesand existing mechanical eq

Ready Envelope +22% Lighting -10%

Project Type

Basic Information



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

State: Washington

City: Richland

Building: **Richland**

- Richmond Highlands
- Ridgefield
- Ritzville
- Riverside (Okanogan)
- Rochester
- Rockford
- 1 Of Rock Island
- 2 Co Rosalia
- 3 Kit Roslyn
- 4 Lo Roy
- 5 Royal City
- 6 Ruston
- 6 Saint John (Whitman)
- 7 Salmon Creek
- 8 Satus
- 8 SeaTac
- 9 Seattle
- 10 Sedro-Woolley
- Selah
- Sequim
- Shelton
- Silverdale

Project Type

New Construction Addition

Project Information

Project Name
Sigma 4 Office Building
3170 George Washington Way

Designer/Contractor
Joe's Construction
George, Washington

Document Author
KRT

Notes
Existing construction major renovation with lighting design (existing fixtures and existing mechanical eq

If you can't find the building's city, choose a nearby city that has similar weather conditions.

Envelope +22% Lighting -10%



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

State: Washington
City: Richland

Project Type:
 New Construction Additions

Building Use:
 Whole Building Area Category

	Area Category	Area	W/ft2
1	Office	15849	1.5
2	Corridor, Restroom, Suppor	3838	0.8
3	Kitchen	505	2.2
4	Lobby - Other	340	1.0
5			
6			
7			
8			
9			
10			

Total Area: 20532

Project Information:
Project Name: Sigma 4 Office Building
3170 George Washington Way

Designer/Contractor:
Joe's Construction
George, Washington

Document Author:
KRT

Notes:
Existing construction major renovation with lighting design (existing fixtures and existing mechanical eq

Envelope: +22% Lighting: -10%

Four Main Screens

Building Use
Whole Bldg. or
Area Category

Compliance Results:



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project **Envelope** Lighting Mechanical

Roof Skylight **Ext. Wall** Int. Wall Window Door Basement Floor

Assembly	Construction Details	Gross Area or Slab Perimeter	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1 Non-Wood Joist/Rafter/Truss		20532 ft2	19.0	8.0	0.040		
2 Metal Frame, 16" o.c.		8172 ft2	10.0	0.0	0.145		
3 Metal Frame, Double Pane	Glazing: Tinted	998 ft2			0.690	0.57	0.50
4 Glass	Glazing: Clear	126 ft2			0.920	0.47	0.00
					0.700		

Main Building Envelope

1. This is where you add square footage values for roofs, exterior walls, windows, etc.
2. This is where you add *U*-factors and R-values for ceilings, exterior walls, windows etc.
3. Continuous insulation is entered separately from cavity insulation.

Use the Options Menu to Add or Remove Orientation and Daylighting Control Factor.

Envelope +22% Lighting -10%



Envelope Section

The screenshot displays the software interface for COMcheck-EZ 2.5. The title bar shows 'Untitled - COMcheck-EZ 2.5 Release 1' and 'CODE: 2001 IECC'. The menu bar includes 'File', 'Edit', 'View', 'Options', 'Code', and 'Help'. Below the menu bar is a toolbar with icons for file operations. The main interface has a tabbed menu with 'Project', 'Envelope', 'Lighting', and 'Mechanical'. The 'Envelope' tab is active, showing sub-options: 'Roof', 'Skylight', 'Ext. Wall', 'Int. Wall', 'Window', 'Door', 'Basement', and 'Floor'. A red box highlights these sub-options. Below the menu is a table with columns: 'Assembly', 'Construction Details', 'Gross Area', and 'Cavity Insulation R-Value'. A red box highlights the 'Assembly' and 'Construction Details' columns. A red box at the bottom contains the text: 'Building Components are added by clicking on these.' Two red arrows point from this text box to the 'Assembly' and 'Construction Details' columns in the table.

Assembly	Construction Details	Gross Area	Cavity Insulation R-Value
..... Building			

Building Components are added by clicking on these.



Building Envelope

Activity Areas

Office: 15,849 sq.ft.

Halls/Corridors/Transitions:
3338 sq.ft.

Restrooms: 500 sq.ft.

Kitchen: 505 sq.ft.

Lobby: 340 sq.ft.

Roof: 20,532 sq. ft. wood truss, R-19 insulation

Exterior Walls: 8,172 sq. ft., 2 X 4 metal frame at 16" O.C., R-10 insulation

Walls Perimeter: 681 ln. ft.

Windows: 998 sq. ft. metal frame, double pane, tinted, U-value 0.69, SHGC - 0.57, P.F. 0.50

Metal Door: 21 sq. ft. U-value 0.70

Glass Doors: 126 sq. ft. clear glazing, U-value 0.92, SHGC - 0.47

Floor: 20,532 sq. ft./681 linear feet, unheated slab on grade, no insulation

Water Heaters: 2 electric, 80 gal. capacity

Window/Wall Ratio: 12%



Building Section

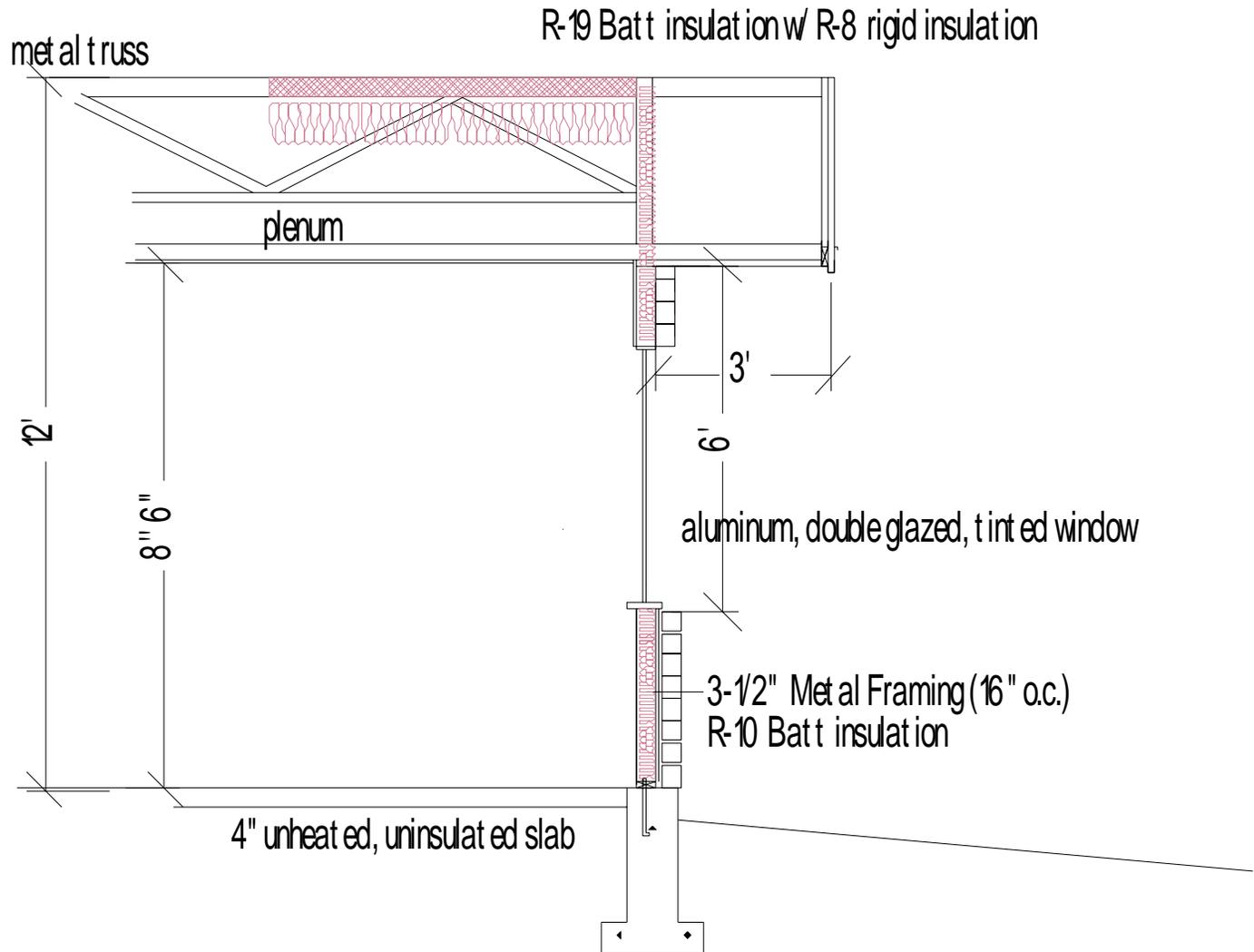
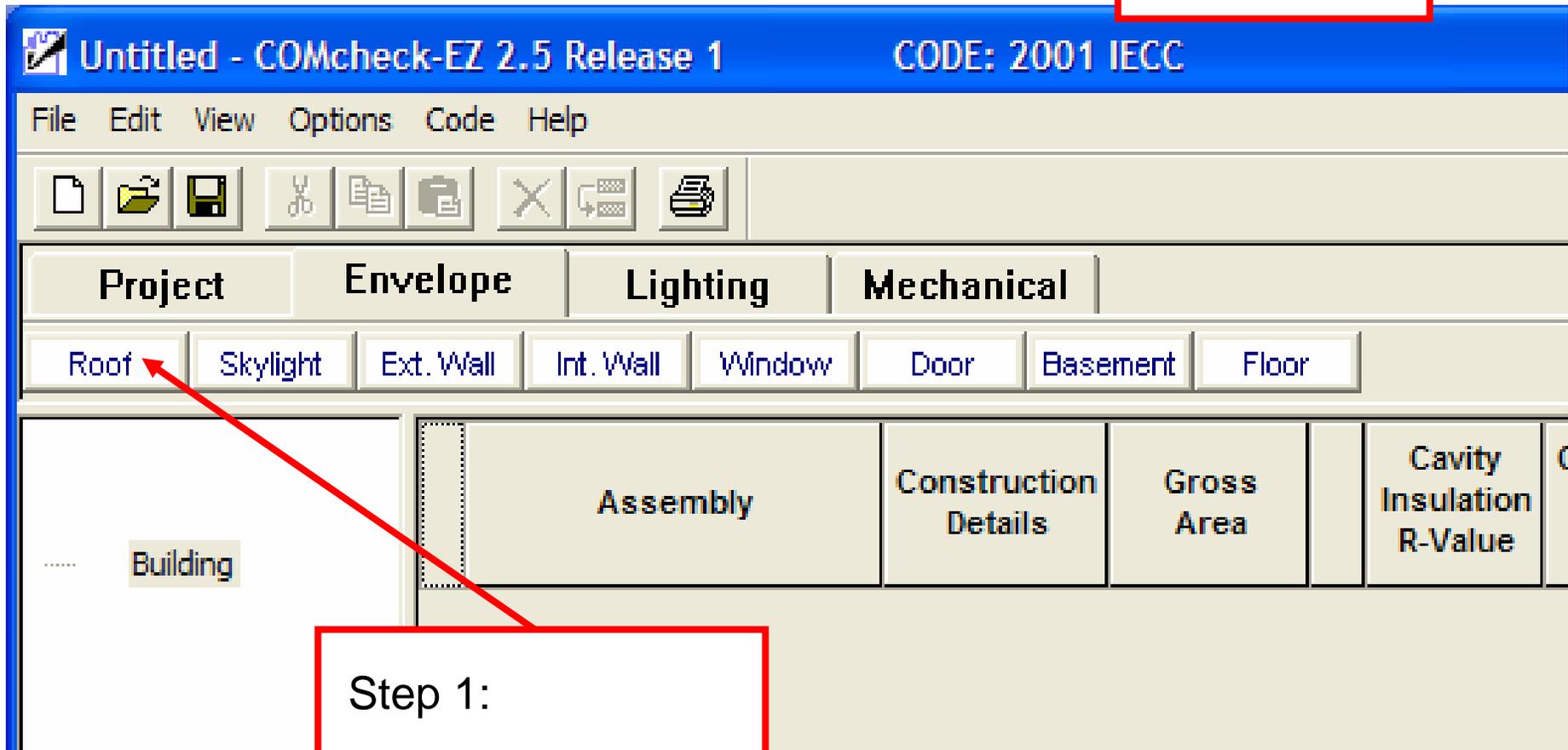


TABLE 802.2(24)
BUILDING ENVELOPE REQUIREMENTS^{a through e} - CLIMATE ZONE 10b

WINDOW AND GLAZED DOOR AREA OVER 10 PERCENT BUT NOT GREATER THAN 25 PERCENT OF ABOVE-GRADE WALL AREA			
ELEMENT	CONDITION/VALUE		
Skylights (<i>U</i> -factor)	0.8		
Slab or below-grade wall (<i>R</i> -value)	R-0		
Windows and glass doors	SHGC	<i>U</i> -factor	
	PF < 0.25	0.5	0.6
	0.25 ≤ PF < 0.50	0.6	0.6
PF ≥ 0.50	0.7	0.6	
Roof assemblies (<i>R</i> -value)	Insulation between framing	Continuous insulation	
All-wood joist/truss	R-25	R-19	
Metal joist/truss	R-25	R-20	
Concrete slab or deck	NA	R-19	
Metal purlin with thermal block	R-30	R-20	
Metal purlin without thermal block	X	R-20	
Floors over outdoor air or unconditioned space (<i>R</i> -value)	Insulation between framing	Continuous insulation	
All-wood joist/truss	R-19	R-12	
Metal joist/truss	R-19	R-13	
Concrete slab or deck	NA	R-12	
Above-grade walls (<i>R</i> -value)	No framing	Metal framing	Wood framing
	Framed		
<i>R</i> -value cavity	NA	R-11	R-11
<i>R</i> -value continuous	NA	R-0	R-0
CMU, ≥ 8 in, with integral insulation			
<i>R</i> -value cavity	NA	R-11	R-11
<i>R</i> -value continuous	R-5	R-0	R-0
Other masonry walls			
<i>R</i> -value cavity	NA	R-11	R-11
<i>R</i> -value continuous	R-5	R-0	R-0



Adding Roofs



Step 1:
Click on Roof



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File Edit View Options Code Help

Project Envelope Lighting Mechanical

Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

Assembly	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1		0	ft2				

Building
Roof 4

- All-Wood Joist/Rafter/Truss
- Non-Wood Joist/Rafter/Truss
- Structural Slab
- Metal Roof without Thermal Blocks
- Metal Roof with Thermal Blocks
- Other

Click the Assembly fields to display a list of assembly choices. "Ot

Adding Roofs

Step 2:

Select Roof Type (This can be repeated so that different roof types and any number of skylights can be added individually.)

Adding Roofs

Untitled - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

	Assembly	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1	Non-Wood Joist/Rafter/Truss		20532 ft ²	0.0	0.0	1.282		

Building
 Roof 1

Step 3:
Add square footage (In this case 20,532 square feet)



Adding Roofs

Untitled - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Step 4:
Add insulation R-Value (R-19
cavity and R-8.0 continuous
in this example)

	Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SPGC	Projection Factor
1	Non-Wood Joist/Rafter/Truss	20532 ft2	19.0	8.0	0.040		

Adding
Roofs



Project Envelope Lighting Mechanical

1

Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

	2	3		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
Building	Assembly	Gross Area						
Roof 1	1 Non-Wood Joist/Rafter/Truss	20532	ft2	19.0	8.0	0.040		

4

- Step 1: Click on "Roof"
- Step 2: Select Roof type
- Step 3: Add square footage
- Step 4: Add insulation R-Value



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File Edit View Options Code Help

Project En **1** Lighting Mechanical

Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

Adding Exterior /Interior Walls

Exterior walls, windows and doors can be added as a total sum or each exposure can be added separately

Assembly	Construction Details	Gross Area or Slab Perimeter		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
Wood Joist/Rafter/Truss		20532	ft2	19.0	8.0	0.040		
Wood Frame, 16" o.c.		8172	ft2	10.0	0.0	0.145		
Window 1	3 Metal Frame, Double Pane Glazing: Tinted	998	ft2			0.690	0.57	0.50
Wood Frame, 16" o.c.		126	ft2			0.920	0.47	0.00
Wood Frame, 24" o.c.		21	ft2			0.700		
Steel Frame, 16" o.c.		0	ft2			0.000		
Steel Frame, 24" o.c.		681	ft2					

Step 1: Click on "Ext. Wall" or "Int. Wall" as applicable

Step 2: Choose Assembly

Step 3: Add square footage

Step 4: Add the R-Values



Adding Windows

File Edit View Options Code Help



Project Envelope Lighting Mechanical
 Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

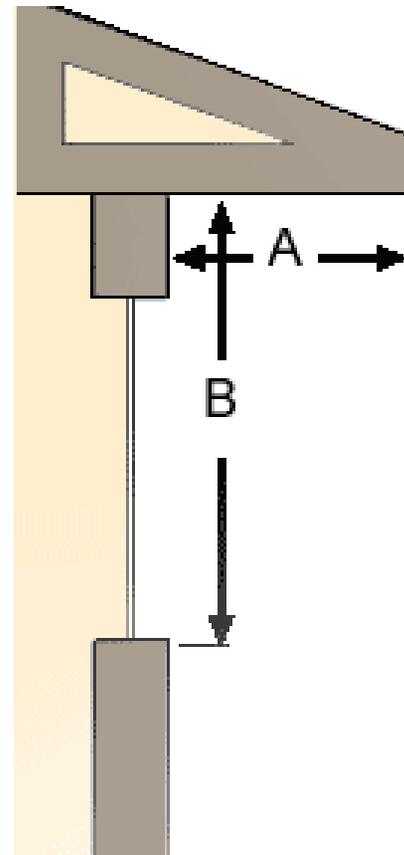
- Building
 - Roof 1
 - Exterior Wall 1
 - Window 1
 - Door 1
 - Door 2
 - Floor 1

	Assembly	Construction Details	Gross Area or Slab Perimeter		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1	Non-Wood Joist/Rafter/Truss		20532	ft2	19.0	8.0	0.040		
2	Metal Frame, 16" o.c.		8172	ft2	10.0	0.0	0.145		
3	Metal Frame, Double Pane	Glazing: Tinted	998	ft2			0.690	0.57	0.50
4	Metal Frame						0.920	0.47	0.00
5	Metal Frame with Thermal Break						0.700		
6	Wood Frame								
	Vinyl Frame								
	Other								

- Metal Frame ▶ Single Pane
- Metal Frame with Thermal Break ▶ Double Pane
- Wood Frame ▶ Double Pane with Low-E
- Vinyl Frame ▶ Triple Pane
- Other ▶ Triple Pane with Low-E



Overhang/Projection Factor (PF)



$$PF = A/B$$

$$PF = 0.5$$

EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

Basement Walls

	Assembly	Construction Details	Gross Area or Slab Perimeter	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor	H
1	Non-Wood Joist/Rafter/Truss		20532 ft2	19.0	8.0	0.040			
2	Metal Frame, 16" o.c.		8172 ft2	10.0	0.0	0.145			
3	Metal Frame, Double Pane	Glazing: Tinted	998 ft2			0.690	0.57	0.50	
4	Glass	Glazing: Clear	126 ft2			0.920	0.47	0.00	
5	Opaque		21 ft2			0.700			
6			0 ft2						
7			681 ft						

- Solid Concrete or Masonry <= 8"
- Solid Concrete or Masonry > 8"
- CMU <=8" with Empty Cells
- CMU >8" with Empty Cells
- CMU <=8" with Integral Insulation
- CMU >8" with Integral Insulation
- Other



Basement Walls



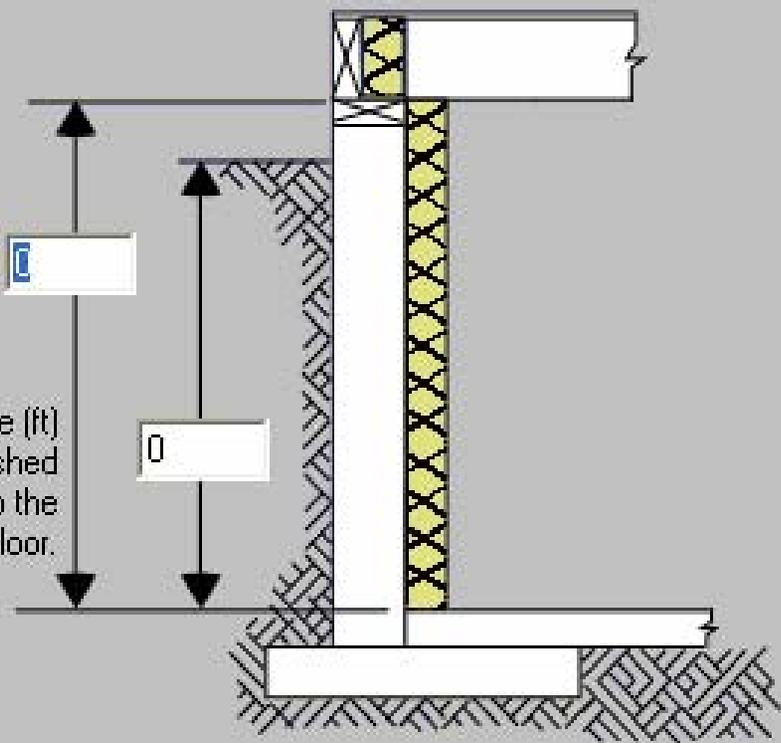
Enter the specified dimensions in feet (not inches) in the boxes provided. Basement walls are walls that are partially or fully below grade. Ignore portions of walls that are more than 10 ft below grade.

1

Wall Height (ft)
Measured from the top of the wall to the basement floor.

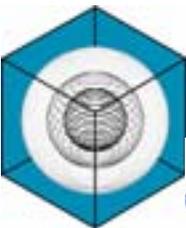
2

Depth Below Grade (ft)
Measured from the finished outside grade to the basement floor.



OK

Cancel



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

Roof Skylight Ext. Wall Int. Wall Window Door Basement Floor

Adding Floors

	Assembly	Construction Details	Gross Area or Slab Perimeter		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1	Non-Wood Joist/Rafter/Truss		20532	ft2	19.0	8.0	0.040		
2	Metal Frame, 16" o.c.		8172	ft2	10.0	0.0	0.145		
3	Metal Frame, Double Pane	Glazing: Tinted	998	ft2			0.690	0.57	0.50
4	Glass	Glazing: Clear	126	ft2			0.920	0.47	0.00
5	Opaque		21	ft2			0.700		
6	Unheated Slab-On-Grade	Insulation: None	681	ft					

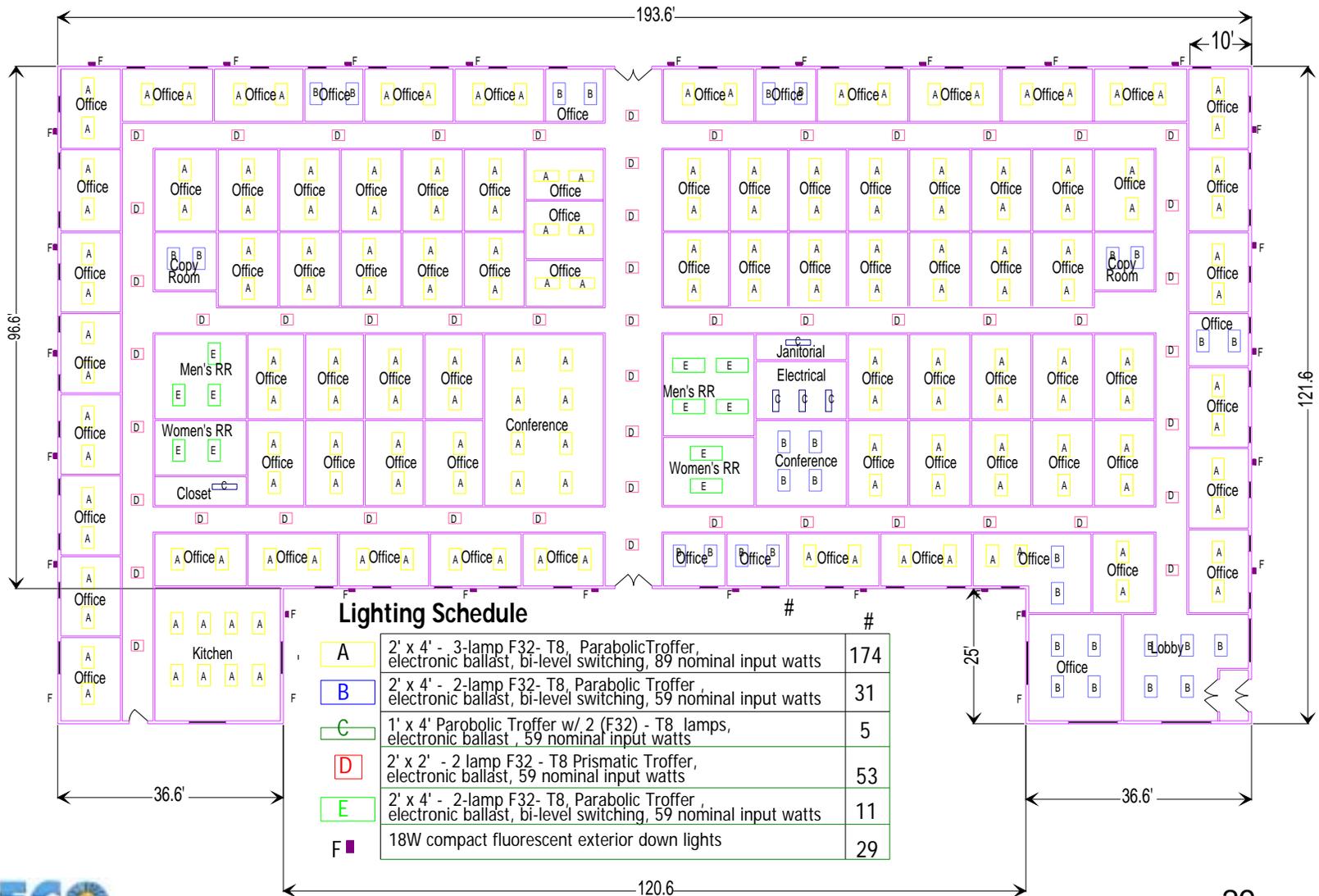
Slab-On-Grade should be entered in linear feet

- Building
 - Roof 1
 - Exterior Wall 1
 - Window 1
 - Door 1
 - Door 2
 - Floor 1

- No Insulation
- Horizontal Insulation
 - 1 ft
 - 2 ft
 - 3 ft
 - 4 ft
 - Continuous
- Vertical Insulation
 - 1 ft
 - 2 ft
 - 3 ft
 - 4 ft
 - Continuous



Lighting Plan



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

T8 / T12 Fluor. Compact Fluor. HID Incandescent

Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage
1 A	2 x 4 Parabolic Troffer	48" T12 40W	Magnetic	4	174	139
2 B	2 x 4 Parabolic Troffer	48" T12 40W	Magnetic	2	31	70
3 C	1 x 4 Parabolic Troffer	48" T12 40W	Magnetic	2	5	70
4 D	2 x 2 Prismatic Troffer	24" T12U 40W	Magnetic	2	53	70
5 E	2 x 4 Prismatic Troffer	48" T12 40W	Magnetic	2	11	70

Building

- T8 / T12 Fluorescent 1
- T8 / T12 Fluorescent 6
- T8 / T12 Fluorescent 3
- T8 / T12 Fluorescent 4
- T8 / T12 Fluorescent 2

Lighting Results

Allowed Wattage 28295 Proposed Wattage 31186

Envelope +22% Lighting -10%

Use the Options Menu to Arrange Lighting Fixtures by Spaces.

Lighting components are added by clicking on these

Lighting Results

Allowed Wattage 28295 Proposed Wattage 31186

Envelope +22% Lighting -10%



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project: T8 / T12 Fluor

Options menu items:

- Comments/Description (Envelope)
- Orientation (Envelope)
- Daylight Control Factor (Envelope)
- Spaces (Lighting)
- Exemptions and Allowances (Lighting)

Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	
1	A	2 x 4 Parabolic Troffer	48" T12 40W	Magnetic	4	174	139
2	B	2 x 4 Parabolic Troffer	48" T12 40W	Magnetic	2	31	70
3	C	1 x 4 Parabolic Troffer	48" T12 40W	Magnetic	2	5	70
4	D	2 x 2 Prismatic Troffer	24" T12U 40W	Magnetic	2	53	70
5	E	2 x 4 Prismatic Troffer	48" T12 40W	Magnetic	2	11	70

Building:

- T8 / T12 Fluorescent 1
- T8 / T12 Fluorescent 6
- T8 / T12 Fluorescent 3
- T8 / T12 Fluorescent 4
- T8 / T12 Fluorescent 2

Allowed Wattage: 28295 Proposed Wattage: 31186

Envelope: +22% Lighting: -10%

Lighting Options:
Spaces
Exemptions and Allowances



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project | Envelope | Lighting | Mechanical

T8 / T12 Fluor. | Compact Fluor. | HID | Incandescent | **Add Space**

Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Exemption Allowance	
1	Space 1							
2	A	2 x 4 Parabolic Troffer	48" T12 40W	Magnetic	4	174	139	None
3	B	2 x 4 Parabolic Troffer	48" T12 40W	Magnetic	2	31	70	None
4	C	1 x 4 Parabolic Troffer	48" T12 40W					
5	D	2 x 2 Prismatic Troffer	24" T12U 40W					
6	E	2 x 4 Prismatic Troffer	48" T12 40W					

Building
Space 1
T8 / T12 Fluorescent 1
T8 / T12 Fluorescent 6
T8 / T12 Fluorescent 3
T8 / T12 Fluorescent 4
T8 / T12 Fluorescent 2

Allowed Wattage: 28295 Proposed Wattage: 31186

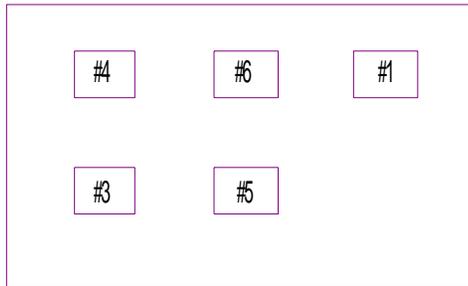
Lighting FAILS: Design 10% worse than code Envelope +22% Lighting -10%

- None
- Special Medical/Dental/Research
- Professional Sports Arena Playing Field
- Gallery/Museum/Monument Exhibits
- Lighting in Residential Dwelling Units
- Emergency Lighting (Automatic Control)

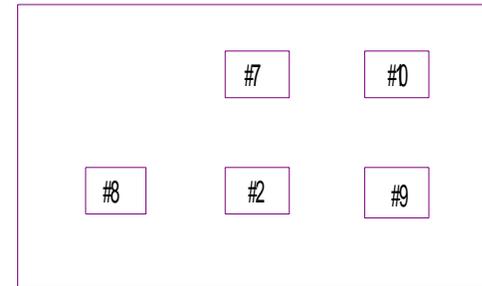


Mechanical Plan

Unit 6
Carrier Heatpump
Rooftop Packaged Unit
Model #50RQ008600KB
Cooling Capacity = 7-1/2 tons
Heating Output = 88,000 Btu/hr
Electric Resistance Heat



Unit 10
Carrier Heatpump
Rooftop Packaged Unit
Model #50VQ0030300
Cooling Capacity = 2-1/2 tons
Heating Output = 30,000 Btu/hr
Airflow = 938 CFM



Unit 5
Carrier Heatpump
Rooftop packaged unit
Model #50RQ008600KB
Cooling Output = 7-1/2 tons
Heating Output = 88,000 Btu/hr
Airflow = 3000 CFM

Units # 1,2,3,4,7,8 & 9
Carrier Heatpump
Roof Top Packaged Unit
Model #50PQ006600QC
Cooling Output = 5 tons
Heating Output = 58,000 Btu/hr
Airflow = 2000 CFM



EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1 CODE: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting **Mechanical**

HVAC System Plant Water Heating

	Quantity	Description
Building		
Water Heating 1	1 2	Service Water Heater
HVAC System 1	2 1	Rooftop Packaged Heat Pump, Cooling Capacity <65 kBtu/h, Air-Cooled Condenser / Single Zone
HVAC System 2	3 7	Rooftop Packaged Heat Pump, Cooling Capacity <65 kBtu/h, Air-Cooled Condenser / Single Zone
HVAC System 3	4 2	Rooftop Packaged Heat Pump, Cooling Capacity >=90 - <135 kBtu/h, Air-Cooled Condenser / Single Zon

Mechanical components are added by clicking on these

The Mechanical section generates a customized list of mandatory requirements applicable to the mechanical components you identify.

Mechanical System Description Wizard



Equipment Type Selection

Heating Equipment Type: _____

- None
- Central Furnace
- Duct Furnace
- Hydronic or Steam Coil
- Heat Pump
- Radiant Heater
- Unit Heater
- Other

Cooling Equipment Type: _____

- None
- Field-Assembled DX System
- Hydronic Coil
- Packaged Terminal DX Unit
- Rooftop Package DX Unit
- Split DX System
- Other

Zoning Category: _____

- Single Zone Perimeter System
- Multiple-Zone Perimeter System

Help

« Previous

Next »

Finish



Save

Print and Preview reports

Last files worked on

EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1

File Edit View Options Code Help

- New Ctrl+N
- Open... Ctrl+O
- Save Ctrl+S
- Save As...
- Print Report... Ctrl+P
- Print Preview
- Print Setup...
- Save Report...
- 1 EZ-Casestudy.cck
- 2 F:\Tasks\... \MDPC.cck
- 3 F:\Tasks\... \Destin Store.cck
- 4 Riverhead store.cck
- Exit

2	Corridor, Restroom, Suppor	3838	0.8
3	Kitchen	505	2.2
4	Lobby - Other	340	1.0
5			
6			
7			
8			



Need Help?

The image shows a screenshot of the COMcheck-EZ software interface. The main window title is "EZ-Casestudy.cck - COMcheck-EZ 2.5 Release 1" and the code is "CODE: 2001 IECC". The menu bar includes File, Edit, View, Options, Code, and Help. The Help menu is open, showing options like Help Topics, About COMcheck-EZ..., and Check for COMcheck Updates. The Help window is also open, displaying the COMcheck-EZ Help content, including a table of contents and a search bar. The "COMcheck-EZ" title is highlighted in the help window. The main window also shows a "Project" and "Envelope" section, and a "State" dropdown menu set to "Washington".

File Edit View Options Code Help

Help Topics

About COMcheck-EZ...

Check for COMcheck Updates

Project Envelope

State Washington

COMcheck-EZ Help

Back Forward Print

Contents Index Search

COMcheck-EZ

Table Columns and Rows

File Menu

Edit Menu

View Menu

Options Menu

Comments/Description (Envelope)

Orientation (Envelope)

Daylight Control Factor (Envelope)

Spaces (Lighting)

Exemptions and Allowances (Lighting)

Context Menu

Code Menu

Help Menu

Project Screen

Envelope Screen

Roofs

Skylights

Exterior Walls

COMcheck-EZ

You can use COMcheck-EZ™ to demonstrate that your commercial or high-rise residential building design complies with the 2001 Edition of the International Energy Conservation Code (IECC). COMcheck-EZ includes a software method and a manual method for demonstrating compliance.

The COMcheck-EZ software provides a highly flexible way to demonstrate compliance with minimal input. The envelope section allows tradeoffs between envelope components, including roofs, walls, windows, floors, and skylights. The lighting section enables you to quickly determine if your lighting design meets interior-lighting power limits. The mechanical section enables you to assemble a customized list of code requirements that are applicable to the systems and equipment in your building.



Note that the 2001 IECC was used

Envelope Compliance Certificate

2001 IECC

COMcheck-EZ Software Version 2.5 Release 1

Data filename: F:\Tasks\BECF Training\Commercial\Case Studies\Originals\EZ-Casestudy.cck

Section 1: Project Information

Project Name:

Sigma 4 Office Building
3170 George Washington Way
Richland, WA 99352

Designer/Contractor:

Joe's Construction
George, Washington

Document Author:

KRT

Notes: Existing construction major renovation with lighting modified lighting design (existing fixtures and existing mechanical equipment)

Section 2: General Information

Building Location (for weather data):

Richland, Washington

Climate Zone:

11b

Heating Degree Days (base 65 degrees F):

4882

Cooling Degree Days (base 65 degrees F):

822

Project Type:

New Construction

Activity Type (s)

Floor Area

Office

15849

Corridor, Restroom, Support Area

3838

Kitchen

505

Lobby - Other

340

Permit Number

Checked By/Date



Section 3: Requirements Checklist

Bldg.Dept. |
Use |

Air Leakage, Component Certification, and Vapor Retarder Requirements

- [] | 1. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
- [] | 2. Windows, doors, and skylights certified as meeting leakage requirements.
- [] | 3. Component R-values & U-factors labeled as certified.
- [] | 4. Vapor retarder installed.

Climate-Specific Requirements

<u>Component Name/Description</u>	<u>Gross Area</u>	<u>Cavity R-Value</u>	<u>Cont. R-Value</u>	<u>Proposed U-Factor</u>	<u>Budget U-Factor</u>
Roof 1: Non-Wood Joist/Rafter/Truss	20532	19.0	8.0	0.040	0.063
Exterior Wall 1: Metal Frame, 16" o.c.	8172	10.0	0.0	0.145	0.101
Window 1: Metal Frame, Double Pane Tinted, SHGC 0.57, PF 0.50	998	---	---	0.690	0.636
Door 1: Glass, Clear, SHGC 0.47	126	---	---	0.920	0.636
Door 2: Opaque	21	---	---	0.700	0.157
Floor 1: Unheated Slab-On-Grade	681	---	---	---	---

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

Envelope PASSES: Design 22% better than code

Section 4: Compliance Statement

The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2001 IECC requirements in COMcheck-EZ Version 2.5 Release 1.

Note: Make sure it has been signed!

Principal Envelope Designer-Name

Signature

Date

Lighting Application Worksheet

2001 IECC

COMcheck-EZ Software Version 2.4 Release 2a

Section 1: Allowed Lighting Power Calculation

A	B	C	D
Area Category	Total Floor Area (ft ²)	Allowed Watts (watts/ft ²)	Allowed Watts (B X C)
Office	15849	1.5	23774
Corridor, Restroom, Support Area	3838	0.8	3070
Kitchen	505	2.2	1111
Lobby - Other	340	1	340
Total Allowed Watts =			28295

Section 2: Actual Lighting Power Calculation

A	B	C	D	E	F
Fixture ID	Fixture Description / Lamp Description / Wattage Per Lamp / Ballast	Lamps/ Fixture	# of Fixtures	Fixture Watt.	(D x E)
A	2 x 4 Parabolic Troffer / 48" T12 40W / Electronic	3	174	89	15486
B	2 x 4 Parabolic Troffer / 48" T12 40W / Electronic	2	31	59	1829
C	1 x 4 Parabolic Troffer / 48" T12 40W / Electronic	2	5	59	295
D	2 x 2 Prismatic Troffer / 24" T12U 40W / Electronic	2	53	59	3127
E	2 x 4 Prismatic Troffer / 48" T12 40W / Electronic	2	11	59	649
Total Actual Watts =				21386	

Section 3: Compliance Calculation

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

Total Allowed Watts = 28295
Total Actual Watts = 21386
Project Compliance = 6909

Lighting PASSES: Design 24% better than code

Permit Number

Checked By/Date

Mechanical Compliance Certificate

2001 IECC

COMcheck-EZ Software Version 2.4 Release 2a

Data filename: F:\Tasks\pam\sigma-ez-one.cck

Section 1: Project Information

Project Name: Sigma 4 Office Building
3170 George Washington Way
Richland, WA 99352

Designer/Contractor: Joe's Construction
George, Washington

Document Author: KRT

Notes: Existing construction with modified lighting design
(existing fixtures and existing mechanical equipment).

Section 2: General Information

Building Location (for weather data): Richland, Washington

Climate Zone: 10b

Heating Degree Days (base 65 degrees F): 4882

Cooling Degree Days (base 65 degrees F): 822

Project Description (check one):

New Construction Addition Alteration Unconditioned Shell (File Affidavit)

Section 3: Mechanical Systems List

<u>Quantity</u>	<u>System Type & Description</u>
1	HVAC System 1: Rooftop Packaged Heat Pump, Cooling Capacity <65 kBtu/h, Air-Cooled Condenser / Single Zone
7	HVAC System 2: Rooftop Packaged Heat Pump, Cooling Capacity <65 kBtu/h, Air-Cooled Condenser / Single Zone
2	HVAC System 3: Rooftop Packaged Heat Pump, Cooling Capacity >=90 - <135 kBtu/h, Air-Cooled Condenser / Single Zone
2	Water Heating 1: Service Water Heater