



Nebraska's Commercial Energy Code: The 2018 IECC *COMcheck Basics*

Nebraska Energy Code Training Program

Instructor: Matt Belcher

December 7, 2022: 10:00 a.m. – 11:30 a.m. CST



Housekeeping

- Attendees are muted upon entry
- Enter questions in the chat box
- This training is being recorded
- Slides and recording will be emailed to attendees and posted on the MEEA website
- CEUs are provided (ICC and AIA)
- Email Corie at canderson@mwalliance.org with any questions

About MEEA

- MEEA is a nonprofit membership organization with 160+ members, including:
 - Utilities
 - Research institutions
 - State and local governments
 - Energy efficiency-related businesses
- MEEA helps stakeholders understand and implement cost-effective energy efficiency strategies



About the Nebraska Training Program

- Goal: prepare the Nebraska workforce for upcoming changes in construction best practices
 - Residential and Commercial Energy Code
 - Building Science
 - Practical Solutions
- Focused on providing training to builders, code officials, design professionals, public officials and students
- For more information, visit:
<https://www.mwalliance.org/nebraska-energy-codes-training-program>



About Matt/Verdatek Solutions



- 40+ Years in the Building Industry
- Served as a Top Building Codes official in the St. Louis area.
- Director of University of Missouri Columbia High Performance Buildings Research Center. Created and Instructed Curriculum for Students and Industry Professionals.
- Currently Assisting University of Missouri Science & Technology in Building and Energy Code Curriculum and Policy
- ICC Member serving on 2012, 2015, 2018 and 2024 Energy Code Development Committee. 2021 Building Code-General Committee
- NAHB-Approved Instructor for Advanced Building Science and Advanced Business Management



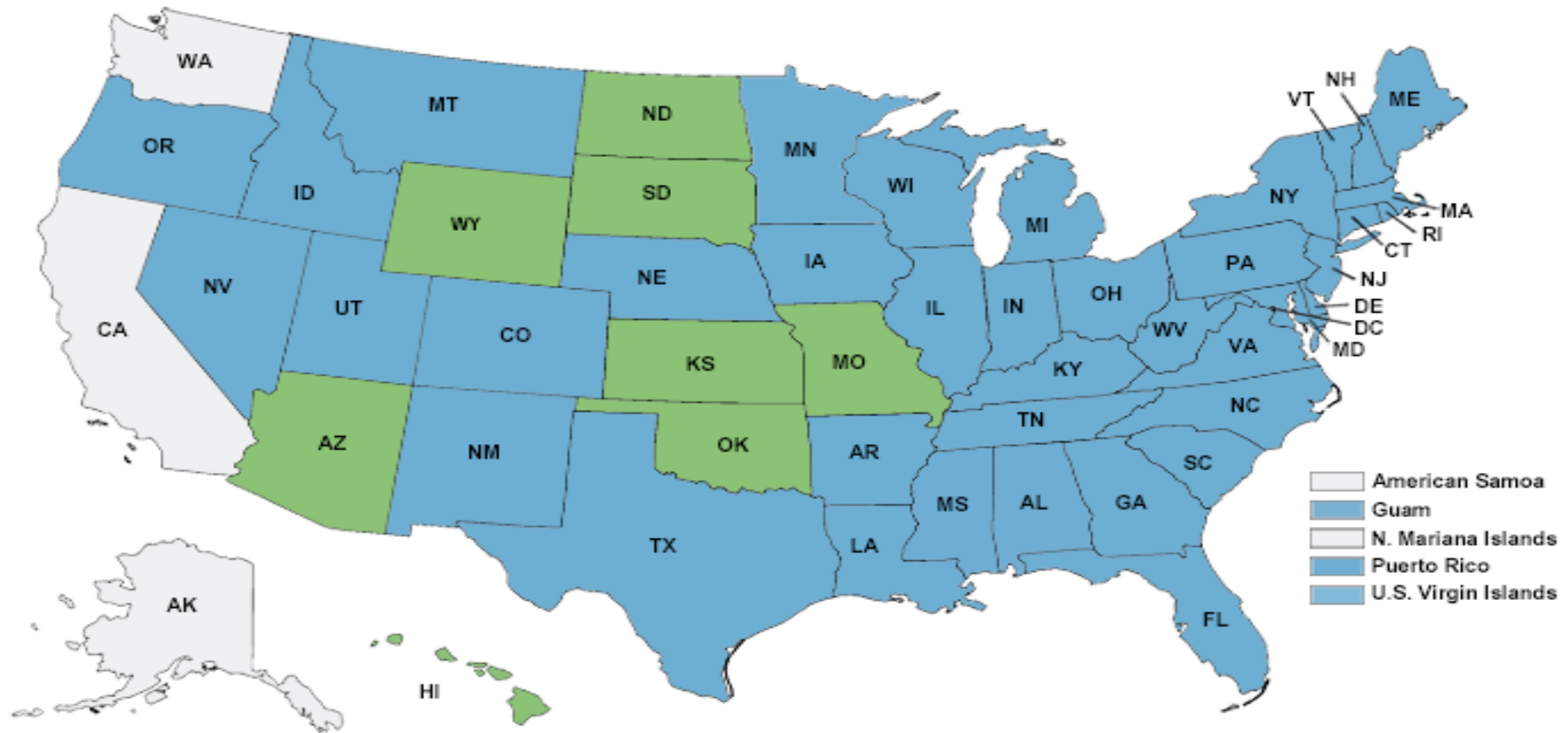


COMcheck Learning Objectives:

Basics of using the COMcheck software, reviewing generated compliance reports and the latest and greatest new features.

1. Obtain an overview of the basic functions and how COMcheck calculates compliance for the building envelope, interior and exterior lighting.
2. Be able to identify the construction specifications needed to complete a compliance calculation in the software.
3. Learn how to enter the building envelope, lighting, and mechanical components into the software.
4. Understand how the compliance reports are created and what they entail.

States that allow COMcheck



As of September 2015

Commercial Compliance Tools

Desktop Software Tools



Web-Based Tools



Free

Printed Materials

Compliance Guides

Prescriptive Tables

3



COMcheck-Web simplifies commercial and high-rise residential energy code compliance.

It performs just like [COMcheck](#), the desktop version, but you don't need to download or install any software on your computer.

- *Can exchange files between desktop and web*



COMcheck/COMcheck Web

- The *COMcheck* software product group makes it easy to determine whether new commercial or high-rise residential buildings, additions and alterations meet the requirements of the IECC and ASHRAE Standard 90.1.
- *COMcheck* also simplifies compliance for building officials, plan checkers and inspectors by allowing them to quickly determine if a building project meets the code.

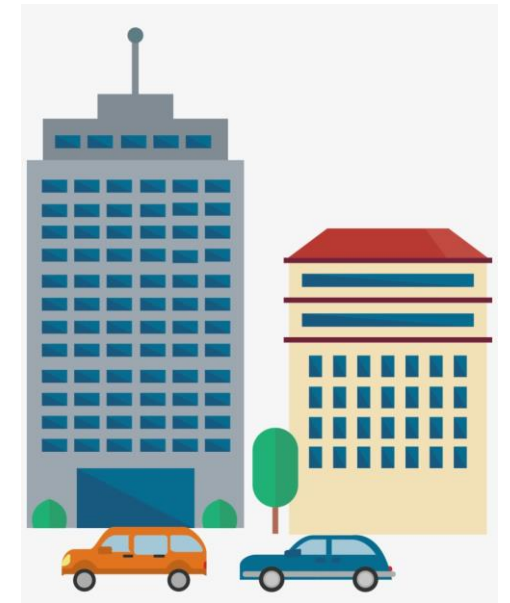
Commercial Buildings in the IECC

Under the Purview of the Commercial Code

- ✓ Buildings with commercial use
- ✓ Multifamily residential buildings four stories or greater in height

Not Under the Purview of the Commercial Code

- × One- and two-family residential
- × R-2, R-3, R-4 three stories or less in height



What About Mixed Use? – C101.4.1

- Treat the residential building portion under the applicable residential code
- Treat the commercial building portion under the commercial code
- Code Official has final authority

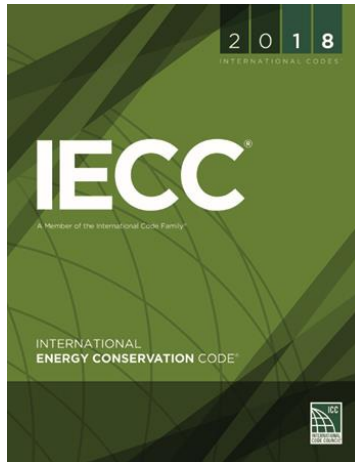


Image: agarch.com

Commercial Compliance Options

ASHRAE 90.1-2016

OR



2018 IECC – Prescriptive

- ✓ C402 – Envelope
- ✓ C403 – Mechanical
- ✓ C404 – SWH
- ✓ C405 – Lighting

AND Pick **at Least One C406:**

- C406.2 – Eff. HVAC Performance
- C406.3 – Reduced Lighting Power
- C406.4 – Enhanced Lighting Controls
- C406.5 – On-site Supply of Renewable Energy
- C406.6 – Dedicated Outdoor Air System
- C406.7 – High Eff. Service Water Heating
- C406.8 – Enhanced Envelope Performance
- C406.9 – Reduced Air Infiltration

OR

2018 IECC – Performance

- C407 – Total Building Performance
- C402.5 – Air Leakage
- C403– Mandatory Mechanical Provisions
- C404 – SWH
- C405 - Lighting
- Building energy cost to be < 85% of standard reference design building



90.1 Simplified Approach Option for HVAC Systems

The simplified approach is an optional path for buildings that meet these criteria:

- Building is two stories or fewer in height.
- Gross floor area is less than 25,000 sq. ft.
- System serving single HVAC zone
- Each HVAC system in the building must comply with all 19 requirements.



COMcheck: Who May Submit?

- The commercial energy code requires that a **registered professional submit compliance documentation** (construction documents and compliance verification).
- In the IECC, Section C103.1 Construction Documents, General, the wording states that construction documentation and other supporting data shall be submitted in one or more sets with each application for a permit.
- The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the code official is authorized to require necessary construction documents to be prepared by a registered design professional.

Landing Page

COMcheck-Web™

Project title: 2009 IECC

Email Address: _____ Password: _____ Log In

Register | Forgotten Password?

New Project

PROJECT | ENVELOPE | INT. LIGHTING | EXT. LIGHTING | MECHANICAL

Reports

Code/Location

Code: 2009 IECC

State: Alabama

City: Abbeville

If your location is not included here, choose a nearby location with similar weather conditions.

Project Type

New Construction Addition Alterations

Project Details (optional)

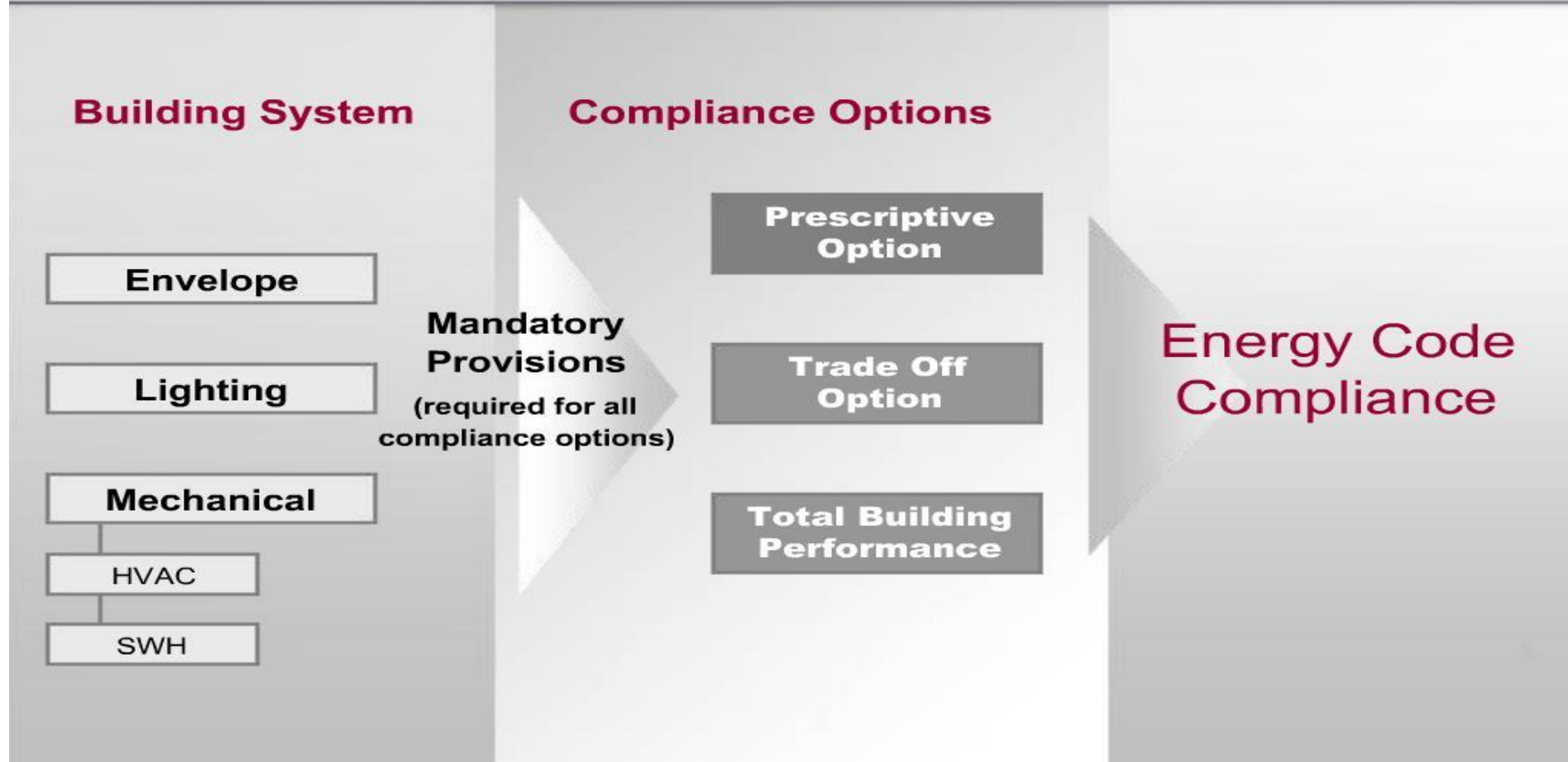
This information will appear on the compliance report. [Edit Project Details...](#)

Building Envelope and Interior Lighting Areas | Exterior Lighting Areas

Add Building Area Duplicate Delete

	Building Area	Area Description	Space Conditioning	Area	W/ft ²
1	Select Area Category...				

Commercial Buildings



Mandatory Requirements Include:

- Air Leakage
- Air barriers
- Fenestration air leakage
- Rooms Containing Fuel-burning Appliances
- Air intakes, exhaust openings, stairways and shafts
- Loading dock weather seals
- Vestibules
- Recessed lighting
- Commissioning

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
 - short wizard to customize a list of requirements applicable to the system identified

9

Envelope Trade-Off Methods:

- ASHRAE 90.1 (Pre-2013) Normative Appendix C Methodology for Building Envelope Trade-Off Option
 - 90.1-2007/2010
 - 2009/2012 IECC
- ASHRAE 90.1-2013 Appendix C has limited performance method (EnergyPlus) *(New)*
- 2015 IECC Component Performance Alternative (Total UA) *(New)*



Project Types:

- New Construction: Trade-off compliance method
- Addition Trade-off compliance method
- Alteration Prescriptive compliance

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



7

Mechanical and Service Hot Water Requirements

- Efficiency requirements
- Economizer requirements
- Fan Power Limitation
- Mandatory requirements
- No compliance metric available

Lighting Requirements

- Mandatory requirements: Controls, Switching
- Interior/Exterior lighting power requirements

Complies if total connected power \leq lighting power allowance



When do Lighting and Power Requirements Apply?

- Original Installed Lighting System in a New Building, Addition, or Tenant Build-out
- Existing Lighting System that is Altered
- Change in Occupancy that Increases Energy
- Change in Occupancy that requires less LPD as shown in the LPD tables

Exceptions:

- Alterations where less than 10% of the luminaires in a space are replaced and installed interior power lighting is not increased
- Lighting within dwelling units
 - Where $\geq 75\%$ of permanently installed fixtures (except low-voltage) are fitted for and include high-efficacy lamps

Electrical Lighting and Power Systems Requirements

- Mandatory Interior Lighting requirements
 - Required Controls
 - Wattage/Efficiency Limits
- Interior Lighting Power Allowances (watts/ft²)
- Exterior Lighting Controls
 - Required Controls
 - Lamp Efficiency
- Exterior Lighting Power Allowances (watts/ft²)
- Dwelling Electric Meters
- Electrical Transformers and Motors
- Vertical and Horizontal Transportation Systems and Equipment



Image: U.S. Dept of Energy

Landing Page

COMcheck-Web™

Project title: 2009 IECC

Email Address | Password | Log In

Register | Forgotten Password?

New Project

PROJECT | ENVELOPE | INT. LIGHTING | EXT. LIGHTING | MECHANICAL

Reports

Code/Location

Code: 2009 IECC

State: Alabama

City: Abbeville

If your location is not included here, choose a nearby location with similar weather conditions.

Project Type

New Construction Addition Alterations

Project Details (optional)

This information will appear on the compliance report. [Edit Project Details...](#)

Building Envelope and Interior Lighting Areas | Exterior Lighting Areas

Add Building Area | Duplicate | Delete

	Building Area	Area Description	Space Conditioning	Area	W/ft ²
1	Select Area Category...				



Code: Standard 90.1-2004

File Edit View Options Code Help

90.1 ('89) Code
90.1 ('99) Standard
90.1 (2001) Standard
✓ 90.1 (2004) Standard
1998 IECC
2000 IECC
2001 IECC
2003 IECC
Georgia
Massachusetts
Minnesota
New York
Vermont

Project **Envelope**

Location
State: Pennsylvania
City: Abbottstown

Project Type
 New Constr

Space Conditioning
 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/Architect

Designer

Notes

Envelope TBD Lighting TBD



COMcheck Basics

- COMcheck is a reflection of the difference between a 'design' building energy performance factor (EPF) and a 'code' or budget building EPF.
- The methodology used to determine EPF is provided in ASHRAE 90.1 Normative Appendix C: Methodology for Building Envelope Trade-off Option.



COMcheck Project Specification Steps

- Project
- Building Envelope Components
- Lighting
- Mechanical
- Requirements/ View/Print/ Save



Information You will need:

- Energy Code
- Builder and project location
- Area take-offs for envelope assemblies
- Insulation R-values, fenestration performance data
- Lighting fixture details
- Heating and cooling system details
- Service water heating details

Landing Page

COMcheck-Web™

Project title: 2009 IECC

Email Address | Password | Log In

Register | Forgotten Password?

New Project

PROJECT | ENVELOPE | INT. LIGHTING | EXT. LIGHTING | MECHANICAL

Reports

Code/Location

Code: 2009 IECC

State: Alabama

City: Abbeville

If your location is not included here, choose a nearby location with similar weather conditions.

Project Type

New Construction Addition Alterations

Project Details (optional)

This information will appear on the compliance report. [Edit Project Details...](#)

Building Envelope and Interior Lighting Areas | Exterior Lighting Areas

Add Building Area | Duplicate | Delete

	Building Area	Area Description	Space Conditioning	Area	W/ft ²
1		Select Area Category...			



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

Code: Standard 90.1-2004

File Edit View Options Code Help

90.1 ('89) Code
90.1 ('99) Standard
90.1 (2001) Standard
✓ 90.1 (2004) Standard
1998 IECC
2000 IECC
2001 IECC
2003 IECC
Georgia
Massachusetts
Minnesota
New York
Vermont

Project Envelope

Location
State: Pennsylvania
City: Abbottstown

Project Type
 New Constr

Space Conditioning
 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.		

Envelope TBD Lighting TBD

Envelope Requirements

Sample.cck - COMcheck 3.9.0 Code: 2009-ECC

Project Envelope Interior Lighting Exterior Lighting Mechanical

Roof Skylight Ext. Wall Window Door Basement Floor

Component	Assembly	Concrete Density	Construction Details	Gross Area or Slab Perimeter	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
Building:									
1 Roof 1	Insulation Entirely Ab...			138319 ft2		25.0	0.039		
2 Exterior Wall 1	Concrete Block 12" ...		Medium ...	38330 ft2		0.0	0.280		
3 Window 1	Wood-Framed, 16" o.c.		Glazing: ...	152 ft2			0.550	0.35	1.45
4 Window 2	Wood-Framed, 24" o.c.		Glazing: ...	532 ft2			0.190	0.25	0.00
5 Window 3	Steel-Framed, 16" o.c.		Glazing: ...	207 ft2			0.550	0.35	1.45
6 Door 1	Steel-Framed, 24" o.c.		Swinging	378 ft2			0.100		
7 Door 2	Metal Building Wall		Non-Sw...	162 ft2			0.130		
8 Door 3	Solid Concrete						0.130		
9 Floor 1	Concrete Block		6", Solid Grouted			0			

Envelope PASSES: Design 1% better than Code

Envelope +1% Interior Lighting T&O Exterior Lighting T&O

U/A Trade-Off Compliance

Compliance: Passes using UA trade-off

Compliance: **12.2% Better Than Code**

Maximum UA: **500**

Your UA: **439**

The % Better or Worse Than Code Index reflects how close to compliance the house is based on code trade-off rules. It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Glazing or Door U-Factor	UA
Exterior Wall Type A: Steel Frame, 16" o.c.	1260	13.0	5.0		88
Window 2: Wood Frame: Double Pane with Low-E	75			0.330	25
Door B: Solid	41			0.420	17
Exterior Wall Type B: Steel Frame, 16" o.c.	2513	13.0	5.0		173
Window 1: Wood Frame: Double Pane with Low-E	210			0.330	69
Window 2: Wood Frame: Double Pane with Low-E	30			0.330	10
Window 3: Wood Frame: Double Pane with Low-E	5			0.330	2
Door A: Glass	24			0.310	7
Roof Type 1: Steel Joist/Rafter, 16" o.c.:2x10	823	0.0	35.0		21
Window 4 - Skylight: Metal Frame with Thermal Break: Triple Pane	32			0.700	22
Window 5 - Skylight: Other	9			0.540	5

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 2010 New York Energy Conservation Code requirements in REScheck Version 4.4.1 and to comply with the mandatory requirements listed in the REScheck Inspect Checklist.

Name - Title

Signature

Date

Envelope Screen

EZ-Casestudy.cck - COMcheck XXXXXXXXXX Code: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting Mechanical

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

	Component	Assembly	Construction Details	Gross Area		Cavity Insulation R-Value	C
1	Roof 1	Non-Wood Joist/Rafter/Tr...		20532	ft2	19.0	

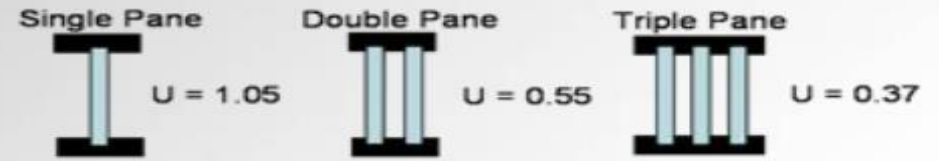
Building Components are added by clicking on these.

17

Windows – U-Factors

Table 102.3(1)
U-Value Default For Windows
Glazed Doors and Skylights

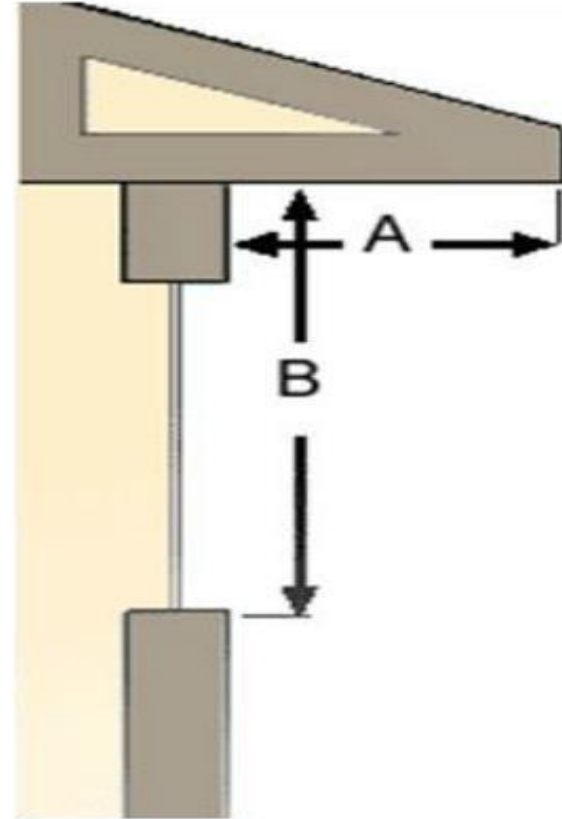
Frame Material and Product Type	Single Glazed	Double Glazed
Metal without thermal break		
Operable (including Sliding and swinging glass door)	1.27	0.87
Fixed	1.13	0.69
Garden Window	2.60	1.81
Curtain Wall	1.22	0.79
Skylight	1.98	1.31
Site-assembled Sloped/overhead glazing	1.36	0.82
Metal with thermal break		
Operable (including Sliding and swinging glass door)		
Fixed	1.08	0.65
Garden Window	1.07	0.63
Curtain Wall	1.11	0.68
Skylight	1.89	1.11
Site-assembled Sloped/overhead glazing	1.25	0.70
Reinforced vinyl/metal clad wood		
Operable (including sliding and swinging glass doors)	0.90	0.57
Fixed	0.98	0.56
Skylights	1.75	1.05
Wood/vinyl/fiberglass		
Operable (including sliding and swinging glass doors)	0.89	0.55
Fixed	0.98	0.56
Garden Window	2.31	1.61
Skylight	1.47	0.84



- NFRC tested and certified or default window U-value range
- Use assembly U-value
- All windows must meet or exceed

25

Overhang/Projection Factor (PF)



$$\text{PF} = A/B$$
$$\text{PF} = 0.5$$

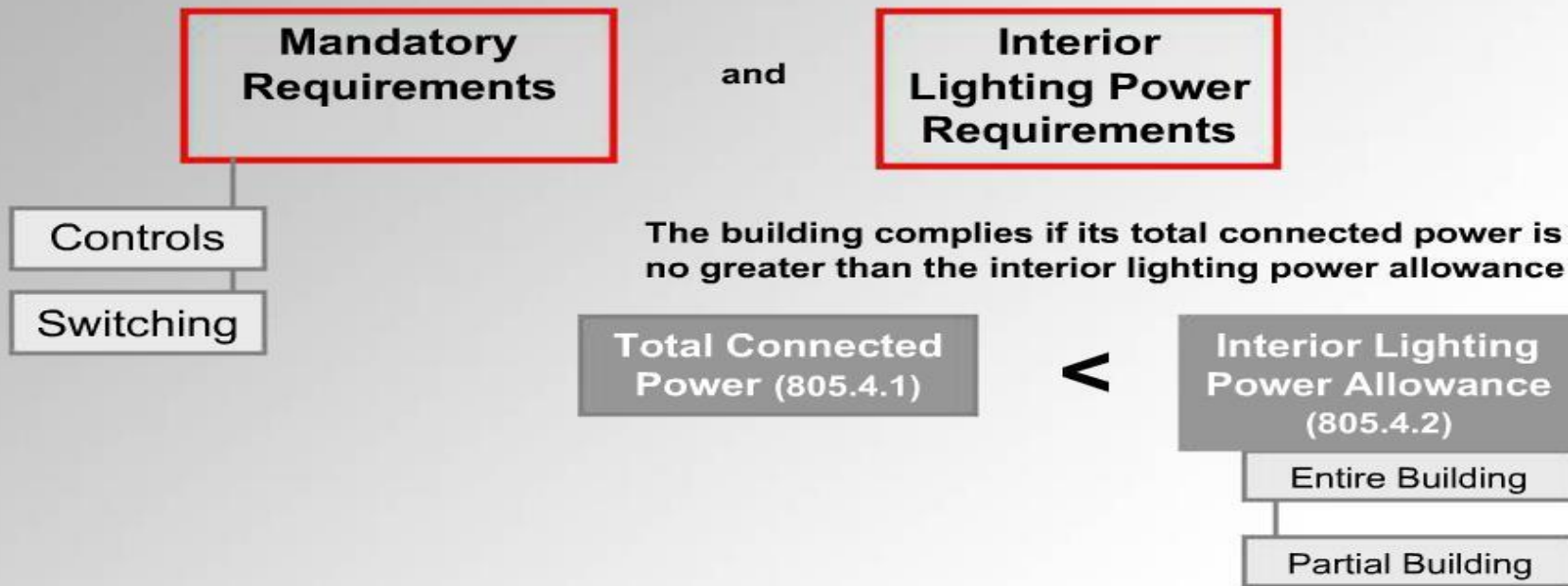


Questions so far?

Please type in chat or unmute



Interior Lighting Compliance



6

Adding Lighting

The screenshot shows the 'EZ-Casestudy.cck - COMcheck' software window. The 'Lighting' tab is active, and the 'Compact Fluorescent' category is selected. A table lists lighting components with columns for Component, Fixture ID, Fixture Description, Lamp Description/Wattage Per Lamp, Ballast, Lamps Per Fixture, Number of Fixtures, and Fixture Wattage. A red box highlights the 'Compact Fluorescent' category and the table headers. A red arrow points from the 'Compact Fluorescent' category to the 'Fixture ID' column. A text box says 'Lighting components are added by clicking on these'. At the bottom, 'Allowed Wattage' is 28295 and 'Proposed Wattage' is 31186. A 'Lighting Results' box points to the '-10%' value in the 'Lighting' field.

Component	Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage
Building							
1 Space 1							
2		Inductive Troffer	48" T12 40W	Magnetic	4	174	139
3		Inductive Troffer	48" T12 40W	Magnetic	2	31	70
4		Inductive Troffer	48" T12 40W	Magnetic	2	5	70
5	T8/T12 Fluorescent 4	2 x 2 Prismatic Troffer	24" T12U 40W	Magnetic	2	53	70
6	T8 / T12 Fluorescent 2	2 x 4 Prismatic Troffer	48" T12 40W	Magnetic			

Lighting Results

Allowed Wattage: 28295 Proposed Wattage: 31186

Envelope: TBD Lighting: -10%

Use the Options Menu to Arrange Lighting Fixtures by Spaces.



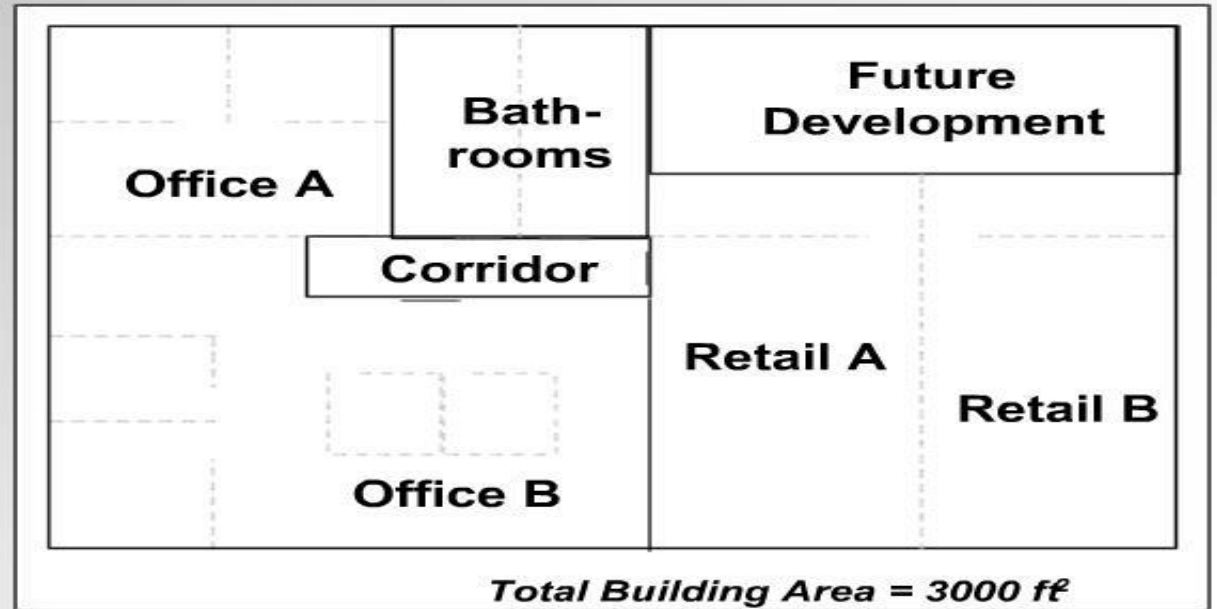
Functional Testing of Lighting Controls

Section C408.3.1

- Prior to passing final inspection, registered design professional to provide evidence that lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working order per construction documents and manufacturer's installation instructions.

Lighting Using Space-by-Space

Office A:	400 ft²
Office B:	850 ft²
Bathrooms:	350 ft²
Corridor:	50 ft²
Retail A:	500 ft²
Retail B:	500 ft²
Future:	350 ft²



Mechanical Systems and SWH Commissioning

Section C408.2

- Prior to the final mechanical and plumbing sections, the registered design professional or approved agency shall provide evidence of mechanical systems commissioning and completion in accordance with section C408.2
- Mechanical Systems exempt from commissioning requirements (all other systems must comply)
 - In buildings where total mechanical equipment capacity is < 480,000 Btu/h (40 tons) cooling capacity **and** < 600,000 Btu/h combined service water heating and space-heating capacity
 - Included in Section C403.3 that serve individual dwelling units and sleeping units

Mechanical

Code: 2001 IECC

File Edit View Options Code Help

Project Envelope Lighting **Mechanical**

HVAC System Plant Water Heating

	Component	Quantity	Equipment Capacity	Fuel Type/ Heat Source	Condenser Type	System Details
Building						
1	Water Heating 1	2				Click here... ...
2	HVAC System 4	1				
3	Rooftop Packaged Heat Pu		Select... ▼		Select... ▼	
4	HVAC System 1	1				
5	Rooftop Packaged Heat Pu		<65 kBtu/h ▼		Air-Cooled ▼	
6	HVAC System 2	7				
7	Rooftop Packaged Heat Pu		<65 kBtu/h ▼		Air-Cooled ▼	
8	HVAC System 3	2				
9	Rooftop Packaged Heat Pu		>=90 - <135 k... ▼		Air-Cooled ▼	Air Economizer ...

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

Envelope TBD Lighting -10%

Use the View Menu to display Requirements.



EZ-Casestudy.cck - COMcheck-EZ Code: 2001 IECC

File Edit View Options Code Help

Project Envelope

HVAC System

Component

Building

1 Water Heating 1

2 HVAC System 4

3 Rooftop Pac

4 HVAC System 1

5 Rooftop Pac

6 HVAC System 2

7 Rooftop Pac

8 HVAC System 3

9 Rooftop Pac

HVAC System

HVAC Equipment Type:

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
- Multiple Zone
- Perimeter System
- Perimeter System

Help OK Cancel

Envelope TBD Lighting -10%

Use the View Menu to display Requirements.

EZ-Casestudy.cck - COMcheck-EZ Code: 2001 IECC

File Edit View Options Code Help

Project Envelope **Lighting** Mechanical

HVAC System Plant **Water Heating**

Component	Quantity	Equipment Capacity	Fuel Type/ Heat Source	Condenser Type	System Details
Building					
1	Water Heating 1	2			Click here...
2	HVAC System 4	1			
3	Rooftop Packaged Heat Pu				
4	HVAC System 1	1			
5	Rooftop Packaged Heat Pu		<65		
6	HVAC System 2	7			
7	Rooftop Packaged Heat Pu		<65		
8	HVAC System 3	2			
9	Rooftop Packaged Heat Pu		>=90 - <135 K...	Air-Cooled	Air Economizer ...

Service Water Heating Details

System Has a Circulation Pump

Heat Trace Tape Installed in the System

Help OK Cancel

Envelope TBD Lighting -10%

Use the View Menu to display Requirements.

Alteration Type Project:

- Projects involve changes to or replacement of
 - Existing building components that are part of building envelope
 - Lighting, heating, ventilating, air conditioning, and water-heating equipment
- Specify only those envelope components, lighting fixtures, or mechanical systems/equipment that will exist upon completion of the project
- Alteration detail dialogs
 - Specify exemptions if applicable
 - Additional qualifications may be required (e.g., Window/wall ratio)
- Compliance shown as Pass/Fail for Envelope and Lighting

Existing Buildings

Section C503 - Alterations

- Code applies to any new construction
 - Additions or new work in existing structures
- Unaltered portion(s) may not need to comply
- When complying via ASHRAE 90.1-2016, alterations do not need to comply with C402-C405
- Where existing building exceeds fenestration area limitations of Section C402.4.1 prior to alteration, building is exempt from C402.4.1 provided there is no increase in fenestration area



Image: montgomerycountymd.gov



Existing Buildings

Section C503 - Alterations

- Heating and Cooling
 - New HVAC systems and duct systems that are part of the alteration to comply with Section C403
- Service hot water systems
 - New SWH systems that are part of the alteration to comply with C404
- Lighting Systems
 - New Lighting systems that are part of the alteration to comply with C405
 - **Exception** – alteration that replace <10% of the luminaires in a space provided such alteration does not increase the installed interior lighting power

Existing Buildings - Lighting Power and Systems

Section C502.2.6

New lighting systems installed as part of an addition to comply with C405

- Total interior lighting power to comply C405.3.2
 - Stand alone addition
 - Addition + existing building as a single building
- Total exterior lighting power to comply C405.4.2
 - Stand alone addition
 - Addition + existing building as a single building
- Repairs – C504.2
 - Repairs exempt where only the bulb, ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power



Building Controls are Complicated

- Since 2004, about 30% of all new requirements have been related to building controls
- Control requirements can be difficult to implement and verification is beyond the expertise of most building code officials
- Assumption is that they are implemented and working correctly

Source: https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-26348.pdf

Mandatory Requirements in COMcheck Software

- Requirements Checklist generated automatically based on input
 - applicable code
 - building location

Form Number

Envelope Compliance Certificate
2001 IECC
COMcheckE2 Software Version 3.0 Release 2
Data Release: C:\Program Files\Check\COMcheckE2\2001

Section 1: Project Information:

Project Name: COMcheck E2
Designer/Constructor: Eric Makkela
Document Author: Eric Makkela

Section 2: General Information:

Building Location (for weather data):
Climate Zone:
Heating Degree Days (base 65 degrees F):
Cooling Degree Days (base 65 degrees F):
Project Type:
Window / Wall Ratio:

Building Type:
Office

Section 3: Requirements Checklist:

Req. |
Deq. |
Use |

1. 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.

Air Leakage, Component Certification, and Vapor Retarder Requirements:
All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed

Systems Commissioning and Completion Requirements

Section C408

- Commissioning is critical to ensure that buildings are **working as designed**
- Preliminary and final reports required
- Mechanical and lighting commissioning detailed in section C408

Benefits of Commissioning





Functional Testing of Lighting Controls

Section C408.3.1

- Prior to passing final inspection, registered design professional to provide evidence that lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working order per construction documents and manufacturer's installation instructions

Compliance Certificate for Permit

COMcheck



COMcheck Software Version COMcheck-Web

Envelope Compliance Certificate

Project Information

Energy Code:	2012 Ontario Building Code and Chapter 2 of Division 3 of SB-10(2017)
Project Title:	OAA Festival Project 44%
Location:	Toronto / Downtown, Ontario
Climate Zone:	5a
Project Type:	New Construction
Vertical Glazing / Wall Area:	43%
Performance Sim. Specs:	EnergyPlus 8.1.0.009 (EPW: CAN_ON_Toronto.716240_CWEC.epw)

<p>Construction Site: 666 Park Ave. Toronto, Ontario M4M 4M4</p>	<p>Owner/Agent: Ima Driven CanDo Developments 666 Park Ave Toronto, Ontario M4M 4M4 6136015689 Ima.Driven@CanDo.ca</p>	<p>Designer/Contractor: Gerry Conway Conway Architect Inc 185 Mafeking Ave Ottawa K1K2V4 6136015689 ConwayArchitect@gmail.com</p>
---	---	--

Building Area	Floor Area
1-Gnd Fl. Retail (Retail) : Nonresidential	10000
2-2nd - 10th (Office) : Nonresidential	90000
3-Bsmt. (Warehouse) : Nonresidential	10000

Thank you! Questions?

Matt Belcher, Verdatek Solutions

matt@verda-solutions.com

Cell: (314) 749-4189

Corie Anderson, MEEA

canderson@mwalliance.org





Upcoming Trainings

Online **Commercial Energy Code Certificate Course** through Metropolitan Community College (MCC)

- 8-weeks, **January 10-February 28, 2023**
- Tuesdays 6p.m.-8p.m.
- \$50 registration fee
- ICC and AIA CEUs provided

FREE **Duct and Envelope Verifier Training and Train-the-Trainer** in Lincoln, NE. Become DET certified in 2 days or learn to train others in 3 days! The course runs **January 24-26, 2023, 9a.m.-5p.m.**



Pol: MCC Commercial Energy Code Course

Online MCC Commercial Energy Code Certificate Course

- 8-weeks, January 10-February 28, 2023
- Tuesdays 6-8p.m.
- \$50 registration fee
- ICC and AIA CEUs provided