



COMcheck 101...

A New Energy Code Requirement Made Easy

Massachusetts Codes and Standards
Compliance Support Program

PERFORMANCE SYSTEMS
DEVELOPMENT

We Speak  Building



What Is Mass Save®?



- Mass Save® is an initiative sponsored by Massachusetts' gas and electric utilities and energy efficiency service providers, including:
 - The Berkshire Gas Company
 - Blackstone Gas Company
 - Cape Light Compact
 - Columbia Gas of Massachusetts
 - Eversource Energy
 - Liberty Utilities
 - National Grid
 - Unitil
- The Sponsors of Mass Save work closely with the Massachusetts Department of Energy Resources to provide a wide range of services, incentives, trainings, and information promoting energy efficiency that help residents and businesses manage energy use and related costs.



BLACKSTONE
GAS COMPANY



Columbia Gas
of Massachusetts
A Millstone Company

EVERSOURCE

Liberty Utilities

nationalgrid
HERE WITH YOU HERE FOR YOU.



Course Description and Learning Objectives - Today



1. Basics of using the COMcheck software
2. Review generated compliance reports
3. Various helpful features

Learning Objectives:

- Obtain an overview of the basic functions and how COMcheck calculates compliance
- Identify the construction specifications needed
- Learn how to enter the building envelope, lighting, and mechanical components
- Understand how the compliance reports are created

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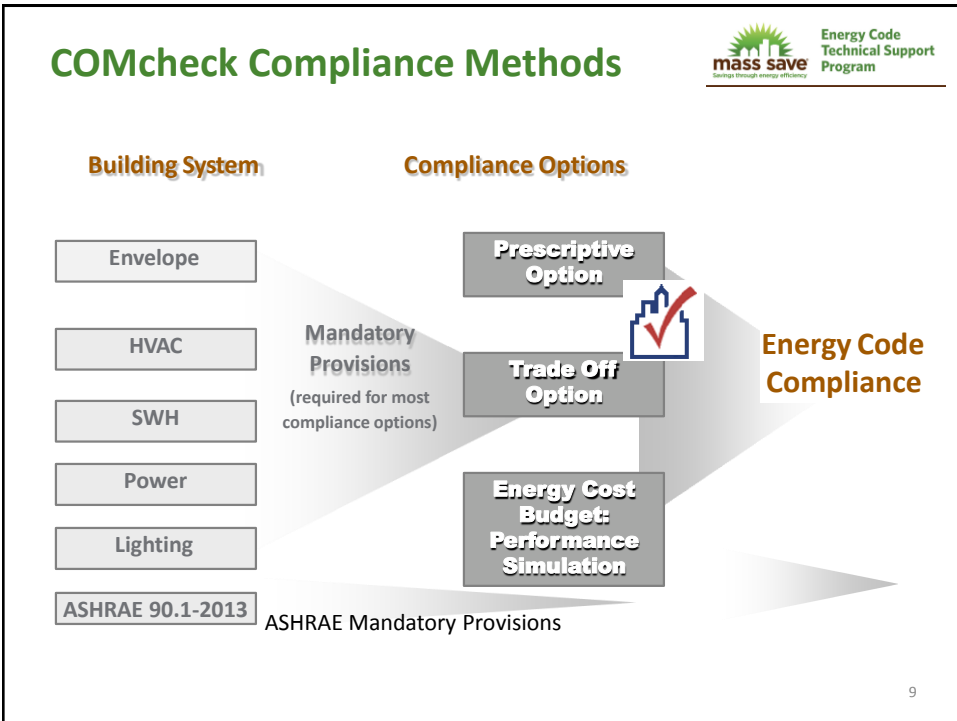
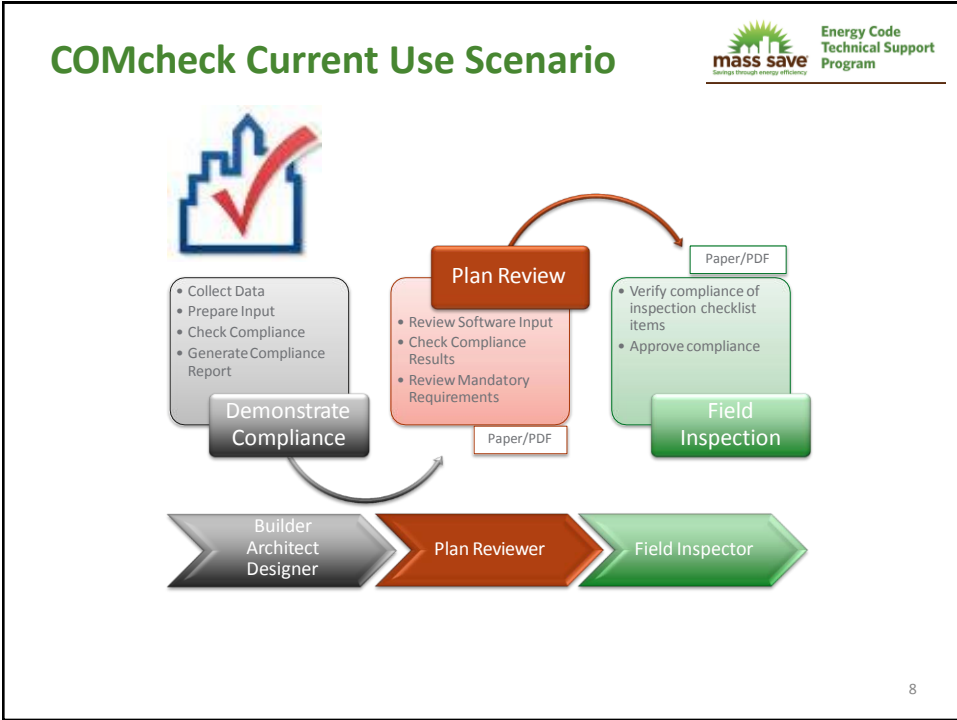
New To MA Stakeholders - COMcheck Required



NEW!

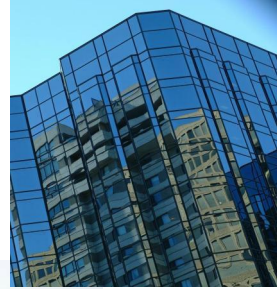
- **107.2.6 COMcheck Submittal Required**
- **ALL Permits Shall Include Completed COMcheck**
 - Envelope, Lighting and Mechanical Compliance Certificates
 - Plan Review Inspection Checklist for:
 - Compliance with the Energy Provisions of 780 CMR 13.00: Energy Efficiency
 - Advantage: Documentation for Code Compliance, Inspection
 - Lack of documentation is ALWAYS the biggest challenge for code enforcement

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Project Types

- ▶ **New Construction:**
 - Trade-off compliance method
 - Prescriptive – Oregon only
- ▶ **Addition**
 - Trade-off compliance method
 - Prescriptive – Oregon only
- ▶ **Alteration**
 - Prescriptive compliance



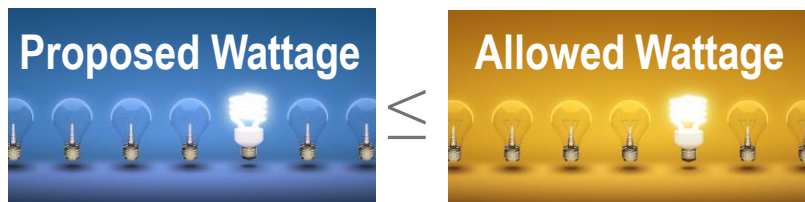
1
0

Lighting Compliance

Mandatory requirements: controls, switching

Interior/exterior lighting power limitations

Complies if total connected power \leq lighting power allowance



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Mechanical/Service Hot Water Compliance



- Efficiency requirements
- Economizer requirements
- Fan power limitation
- Mandatory requirements
- No compliance metric available



COMcheck Software Version 4.0.7.2 Review Mechanical Compliance Certificate

Project Information

Energy Code: 2015 IECC
 Project Title: Test Hotel 1
 Location: Abington, Massachusetts
 Climate Zone: 5a
 Project Type: New Construction

Construction Site: _____ Owner/Agent: _____ Designer/Contractor: _____

Additional Efficiency Package

Reduced interior lighting power. Requirements are implicitly enforced within interior lighting allowance calculations.

Mechanical Systems List

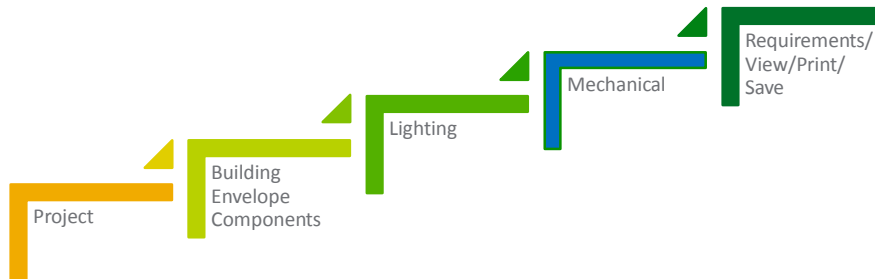
Quantity	System Type & Description
1	HVAC System 1 (Single Zone) Heating: 1 each - Central Furnace, Gas, Capacity = 60 kBtu/h Proposed Efficiency = 80.00% Ef, Required Efficiency = 80.00% Ef Cooling: 1 each - Single Package DX Unit, Capacity = 19 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: Low Capacity Residential Proposed Efficiency = 14.00 SEER, Required Efficiency: 14.00 SEER Fan System: FAN SYSTEM 1 RTU 1 -- Compliance (Motor nameplate HP method) : Passes Fans: FAN 1 Supply, Constant Volume, 800 CFM, 0.3 motor nameplate hp, 90.0 fan efficiency grade
1	HVAC System 2 (Single Zone): Packaged Terminal Heat Pump Heating Mode: Capacity = 11 kBtu/h, Proposed Efficiency = 3.40 COP, Required Efficiency = 2.80 COP Cooling Mode: Capacity = 12 kBtu/h, Proposed Efficiency = 12.00 EER, Required Efficiency: 10.40 EER Fan System: Unspecified

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COMcheck Version 4.0.7.2 Review and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title _____ Signature _____ Date _____

COMcheck Project Specification Steps



Info You'll 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

1
4

Resources



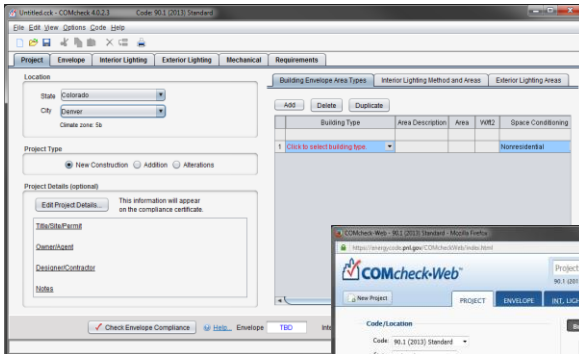
www.energycodes.gov

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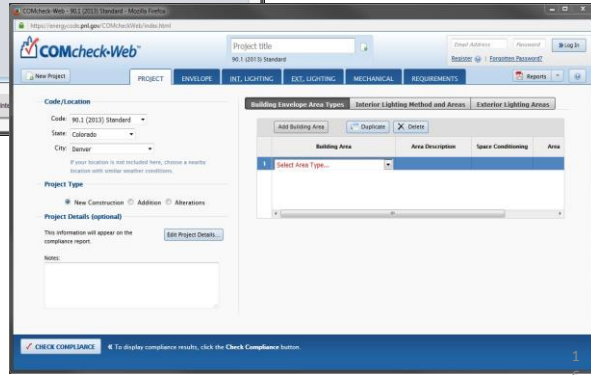
COMcheck



“DESKTOP”



WEB

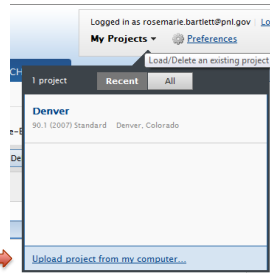
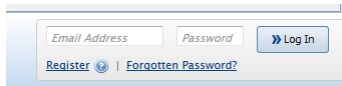


Desktop/Web Data Exchange

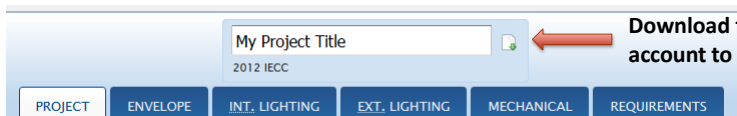


► Can exchange files between desktop and web

- Log in to web
- My Projects



Upload from desktop to web account



Download from web account to desktop

COMcheck Basics: Cues & feedback



Red

8	Window 4 in wall 2	Wood-Frame, 24" o.c.	1-Law library	South	Product ID: AK321	1500	19.0	5.0	0.047		
9	Window 4 in wall 4	Metal Frame Fixed	1-Law library	North	Product ID: AK321	500	0	0.420	0.40		
10	Exterior Wall 5	Wood-Frame, 24" o.c.	1-Law library	North		0	0	0.288			

Blue

✓ Check Envelope Compliance Help... Envelope **TBD** ← Lighting +21% Exterior Lighting +15%

Green

Envelope +0.9% ← Lighting +21% Exterior Lighting +15%

Compliance bar →

Status bar →

PassiveZoneWoodFrameCode.cck - COMcheck 4.0.8.1 Code: 2015 IECC

File Edit View Options Code Help

Project Envelope Interior Lighting Exterior Lighting Mechanical Requirements

Add Fixture Fixture Library

	Component	Fixture ID	Fixture Description	Lamp Description/ Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Track Lighting Wattage
1	Building		Allowed wattage = 10100	Proposed wattage = 8000					
2	Law library (Court Hou		Allowed wattage = 10100	Proposed wattage = 8000					
3	LED 1 copy 1			LED Linear 19W		1	200	16	
4	LED 1			LED Linear 19W		1	300	16	

Envelope +0.9% Interior Lighting +21% Exterior Lighting +15%

Interior Lighting Passes: Design 21% better than Code

COMcheck Basics: Menus and Toolbars



MA example.cck - COMcheck 4.0.8.1 Code: 2015 IECC

File Edit View Options Code Help

Project Envelope Interior Lighting Exterior Lighting Mechanical Requirements

Location

State: Massachusetts

City: Abington

Climate zone: 5a

Building Envelope Area Types Inta

Add Delete Duplicate

Building Type

General

- File options
- Version update check
- Upload usage data

Project

- Code/location
- Envelope

Applicant

- Project details

Reports

- Signatures
- Email reports

CAUsers\d3A870\BECPI\CheckApps\trunk\Engine\TestCases\Exam

File Edit View Options Code Help

Lighting Exterior Lightin

Delete Row(s)

Duplicate Row(s) Ctrl+L

Preferences...

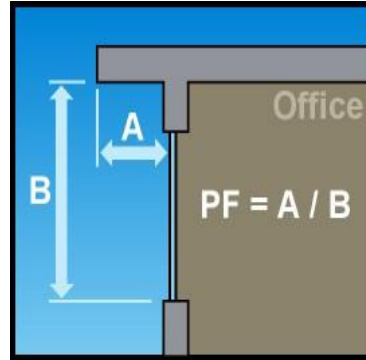
City: Denver

Climate zone: 5b

1
9

COMcheck Basics: Options Menu

- ▶ **Comments**
- ▶ **Orientation (code dependent)**
 - Projection Factor
- ▶ **Visible Transmittance**
- ▶ **Exemptions/Allowances**



Projection Factor

2
0

Project Screen

MA example.cck - COMcheck 4.0.8.1 Code: 2015 IECC

File Edit View Options Code Help

Project Envelope Interior Lighting Exterior Lighting Mechanical Requirements

Location

State: Massachusetts
 City: Abington
 Climate zone: 5a

Project Type

New Construction Addition Alterations

Compliance Options

Efficiency Option: Unspecified [Help...](#)
 Air Barrier Option: Unspecified [Help...](#)

Project Details (optional)

[Edit Project Details...](#) This information will appear on the compliance certificate.
 Title/Site/Permit: _____

Building Envelope Area Types Interior Lighting Method and Areas Exterior Lighting Areas

Add Delete Duplicate

	Building Type	Area Description	Area	Wt%2	Space Conditioning
1	Click to select building type.				Nonresidential

Envelope TBD Interior Lighting TBD Exterior Lighting TBD

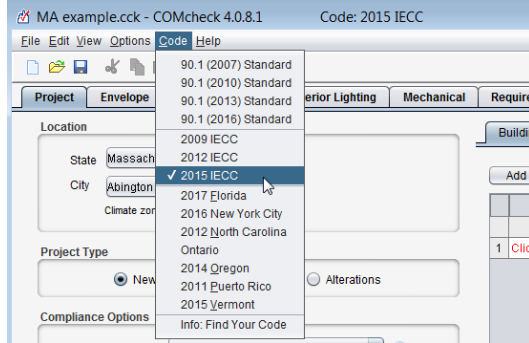
Efficiency Option must be specified (see Project screen)

21

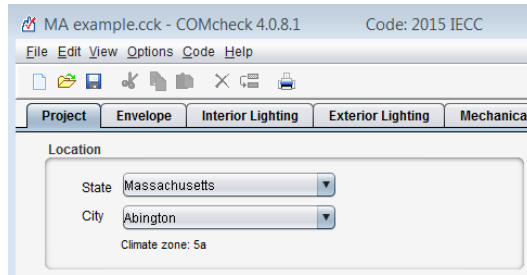
Project: Code and Location



▶ **Appropriate Code**



▶ **Location**

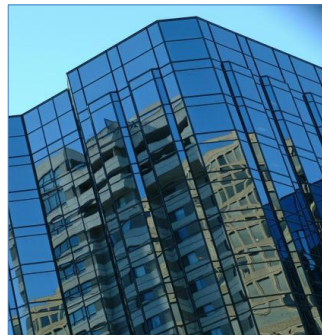
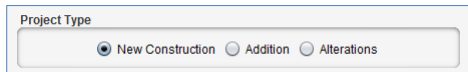


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Project: Project Type



- ▶ **New Construction**
- ▶ **Addition**
- ▶ **Alteration**



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Project: Alteration project type explained



- ▶ **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**

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Compliance Options (IECC only)



- ▶ **Efficiency Options**
 - High performance power (2012/2015)
 - Reduced lighting power (2012/2015)
 - On-site renewable energy (2012/2015)
 - High performance SWH (2015)
 - Enhanced interior lighting controls (2015)
 - Dedicated outdoor air system (2015)

- ▶ **Air Barrier Options (IECC 2012+, climate zone dependent)**
 - Air barrier permeability
 - Assembly permeability
 - Air leakage test

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Project: Project Details

- ▶ **Optional**
- ▶ **Sections**
 - Title/Site/Permit
 - Owner/Agent
 - Designer/Contractor
- ▶ **Included on report**

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Project: Building Area Types

- ▶ **Primarily impacts envelope compliance**
- ▶ **Whole building types that describe the envelope (separating conditioned and unconditioned spaces)**
- ▶ **Space conditioning type**
 - Nonresidential
 - Residential
 - Semiheated (no mechanical cooling) – 90.1 only



Building Envelope Area Types					
Building Type		Area Description	Area	Wft2	Space Conditioning
1	Office	Main law office	10000	0.82	Nonresidential
2	Library	Law library	5000	1.19	Nonresidential
3	Parking Garage	Garage	2000	0.21	Semiheated

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Project: Interior Lighting Method and Area Types



- ▶ Method determines lighting power density and allowances
- ▶ Area category allows for more detailed space representation

Building Envelope Area Types | Interior Lighting Method and Areas | Exterior Lighting Areas

Building Area Method (apply building envelope area types to interior lighting)
 Area Category (Space-By-Space) Method

	Area Category	Area Description	Area	Ceiling Height (ft)	W/ft2
1	Common Space Types:Office - Enclosed	Law Office	8000	NA	1.11
2	Common Space Types:Office - Open Plan	Law Office	2000	NA	0.98
3	Library:Reading Area	Library	5000	NA	1.06
4	Parking Garage:Garage Area	Garage	2000	NA	0.19

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Interior Lighting: Methods



- ▶ Selected method determines lighting power densities in interior lighting and exterior lighting screens
 - based on code, method, and applications selected on the Project screen

Building Envelope Area Types | Interior Lighting Method and Areas | Exterior Lighting Areas

	Building Type	Area Description	Area	W/ft2	Space Conditioning
1	Office	Main law office	10000	0.82	Nonresidential
2	Library	Law library	5000	1.19	Nonresidential
3	Parking Garage	Garage	2000	0.21	Semiheated

Building Envelope Area Types | Interior Lighting Method and Areas | Exterior Lighting Areas

Building Area Method (apply building envelope area types to interior lighting)
 Area Category (Space-By-Space) Method

	Area Category	Area Description	Area	Ceiling Height (ft)	W/ft2
1	Common Space Types:Office - Enclosed	Law Office	8000	NA	1.11
2	Common Space Types:Office - Open Plan	Law Office	2000	NA	0.98
3	Library:Reading Area	Library	5000	NA	1.06
4	Parking Garage:Garage Area	Garage	2000	NA	0.19

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Project: Exterior Lighting Area Types

Exterior Lighting Zone:

Exterior Li	Area Description	Units
	High activity metropolitan commercial district	
	Light industrial area with limited nighttime use	
	Developed area in national or state park	
1	Parking area	ft2
	Developed area on forest land	
	Developed rural area	
	Other	

▶ Zone and area type determine:

- Lighting power density
- Units
- Tradability

Exterior Lighting Zone:

	Exterior Lighting Area	Area Description	Quantity	Units	W/Unit	Tradable
1	Main entry	Front entry	15	ft of door width	30	Yes
2	Illuminated area of facade wall or surface	North facade	2000	ft2	0.2	No

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Exterior Lighting: Tradable Applications

- ▶ Tradable areas allow 'unused' allowable power to be traded between other tradable area (e.g., driveways and entry ways)
- ▶ Generally based on length or area of application and then summed



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Exterior Lighting: Non-Tradable Applications



- ▶ Non-tradable areas/applications are “use it or lose it” (e.g., building façade lighting, ATM stations)



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Project Summary and Example



MA example.cck - COMcheck 4.0.8.1 Code: 2015 IECC

File Edit View Options Code Help

Project Envelope Interior Lighting Exterior Lighting Mechanical Requirements

Location
 State: Massachusetts
 City: Abington
 Climate zone: 5a

Project Type
 New Construction Addition Alterations

Compliance Options
 Efficiency Option: High Performance HVAC
 Air Barrier Option: Air barrier permeability

Project Details (optional)
 Edit Project Details... This information will appear on the compliance certificate.
 Title/Site/Permit

Building Envelope Area Types Interior Lighting Method and Areas Exterior Lighting Areas

Exterior Lighting Zone: High activity metropolitan commercial dis...

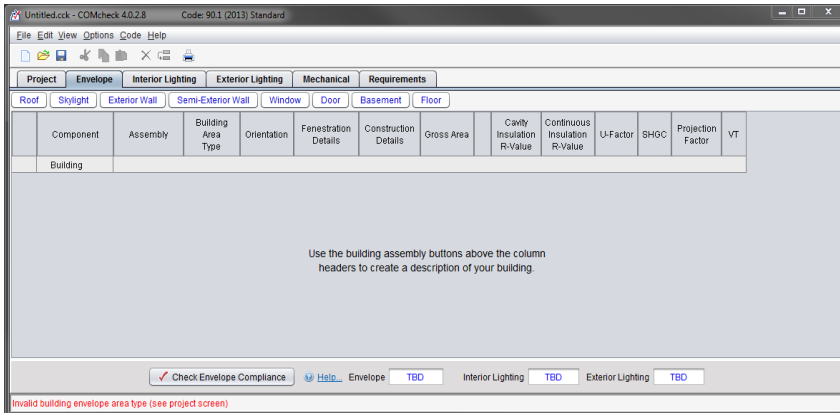
Add Delete Duplicate Help...

	Exterior Lighting Area	Area Description	Quantity	Units	W/Unit	Tradable
1	Main entry		30	ft of doc...	30	Yes

Envelope +22.5% Interior Lighting +81% Exterior Lighting +9%

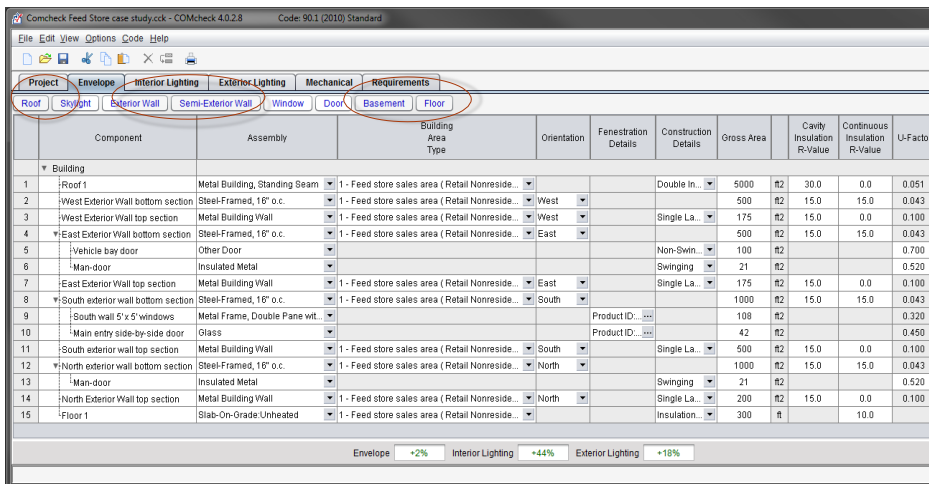
33

Envelope: Introduction



- ▶ **Cavity Insulation R-value – insulation placed between structural members**
- ▶ **Continuous Insulation R-value – ‘continuous’ insulation across the structure (e.g., rigid insulation) After you’ve entered building components, look at compliance result**
 - Look for fields with red text
 - TBD, look for missing data

Envelope: Opaque Assemblies



- ▶ **Cavity Insulation R-value – insulation placed between structural members**
- ▶ **Continuous Insulation R-value – ‘continuous’ insulation across the structure (e.g., rigid insulation)**

Envelope: Fenestration



- ▶ NFRC site-built certified product
- ▶ Performance evaluated (per NFRC guidelines)
- ▶ Energy code defaults

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Envelope: 2015 IECC Fenestration Requirements



- ▶ Menu View->Glazing Requirements

Area-Weighted Average U-Factor		
	Proposed	Maximum
Fixed Vertical Fenestration	0.36	0.36
Operable Vertical Fenestration	0.29	0.43
Entrance Doors	0.00	0.77
Skylights	0.00	0.00

SHGC (applicable to each fenestration assembly)		
Vertical Fenestration: North Orientation		
	Proposed	Maximum
Projection Factor < 0.2	0.53	
0.2 <= Projection Factor < 0.5	0.58	
Projection Factor >= 0.5	0.64	
Vertical Fenestration: South/East/West Orientation		
	Proposed	Maximum
Projection Factor < 0.2	0.40	
0.2 <= Projection Factor < 0.5	0.48	
Projection Factor >= 0.5	0.64	
Skylight	0.40	

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Envelope: Summary



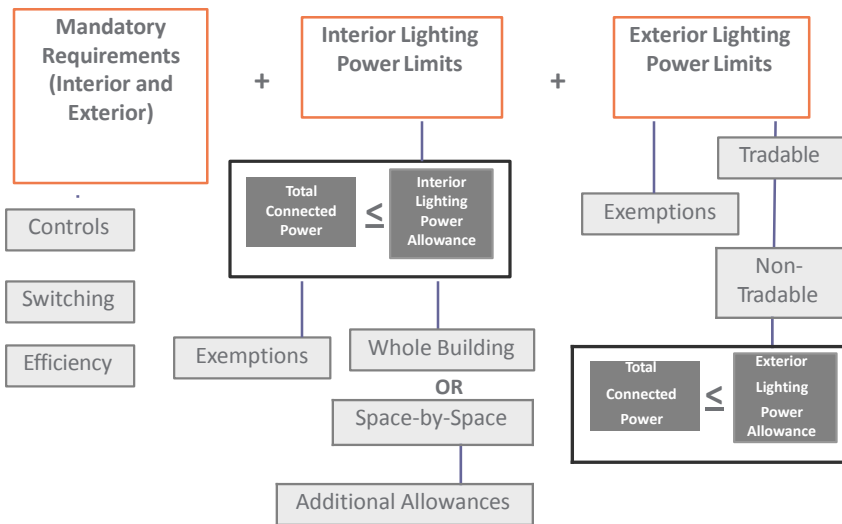
Component	Assembly	Building Area Type	Orientation	Fenestration Details	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1	Roof	Insulation Entirely Above	1 - Law library			10000	R2	30.0	0.032		
2	Exterior Wall 1	Wood-Frame, 24" o.c.	1 - Law library	North		1000	R2	13.0	7.5	0.050	
3	Window 1	Metal Frame Fixed	1 - Law library		Product ID: AX321	300	R2		0.360	0.40	0.00
4	Exterior Wall 2	Wood-Frame, 24" o.c.	1 - Law library	East		1000	R2	13.0	7.5	0.050	
5	Window 2 in Wall2	Metal Frame Fixed	1 - Law library		Product ID: AX321	300	R2		0.360	0.40	0.00
6	Exterior Wall 3	Wood-Frame, 24" o.c.	1 - Law library	West		1000	R2	13.0	7.5	0.050	
7	Window 3 in wall 3	Metal Frame Fixed	1 - Law library		Product ID: AX321	300	R2		0.360	0.40	0.00
8	Exterior Wall 4	Wood-Frame, 24" o.c.	1 - Law library	South		1000	R2	13.0	7.5	0.050	
9	Window 4 in wall 4	Metal Frame Operable	1 - Law library		Product ID: VWVZ	300	R2		0.280	0.40	0.00
10	Slab floor	Slab-On-Grade/Unheated	1 - Law library		Insulation	400	ft	10.0			

- ▶ Don't have to use every assembly type
- ▶ Can group "like" components
- ▶ Gross area (except slab-on-grade)
- ▶ Use "Other" assembly as needed



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Lighting Compliance



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Interior Lighting: Spaces & Fixtures



- Select space then **Add Fixture** button or **Fixture Library**
- Fixture library preserves frequently used fixtures for future use
- Allowed/Proposed wattage balance maintained

COMcheck Feed Store case study.cck - COMcheck 4.0.2.8
Code: 90.1 (2010) Standard

Project: Envelope Interior Lighting Exterior Lighting Mechanical Requirements

Add Fixture **Fixture Library**

Component	Fixture ID	Fixture Description	Lamp Description Wattage Per Lamp	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Track Lighting Wattage
Building Allowed wattage = 8254 Proposed wattage = 4642							
1 Common Space Types Office - Enclosed (161) Allowed wattage = 186 Proposed wattage = 698							
Incandescent 1	G	Recessed wall wa...	Incandescent 100W	1	2	100.0	
Incandescent 2	H	Desk lighting	Incandescent 50	1	5	50.0	
Linear Fluorescent 8	X	Overhead	48" T8 32W	4	2	124.0	
2 Retail Sales Area (4760 sq.ft.) Allowed wattage = 7997 Proposed wattage = 3686							
Linear Fluorescent 7	F	2x4 pendant	96" T8 75W	2	28	132.0	
3 Common Space Types Restrooms (72 sq.ft.) Allowed wattage = 71 Proposed wattage = 248							
Linear Fluorescent 8 copy 1	Z	Vanity fixture	48" T8 32W	4	2	124.0	

Building Envelope Area Types Interior Lighting Method and Areas Exterior Lighting Areas

Building Area Method (apply building envelope area types to interior lighting)

Area Category (Space-By-Space) Method

Add Delete Duplicate

	Area Category	Area Description	Area	Ceiling Height (ft)	Watt2
1	Common Space Types Office - Enclosed		168	NA	1.11
2	Retail Sales Area		4760	NA	1.69
3	Common Space Types Restrooms		72	NA	0.98

Envelope +2% Interior Lighting +44% Exterior Lighting +18%
40

Lighting Fixture Categories



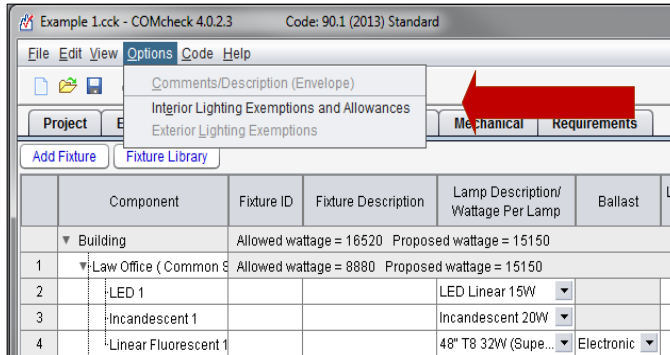
- ▶ Linear fluorescent
- ▶ Compact fluorescent
- ▶ HID
- ▶ Incandescent
- ▶ Halogen Track
- ▶ lighting LED
- ▶ Induction



Lighting: Exemptions and Allowances

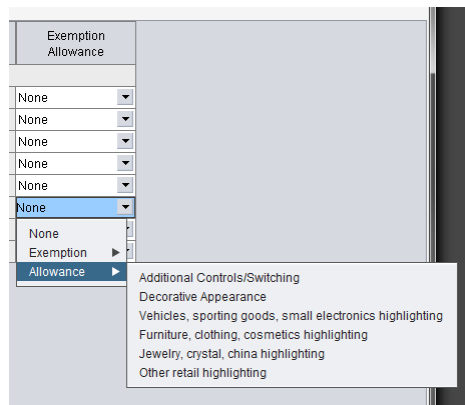
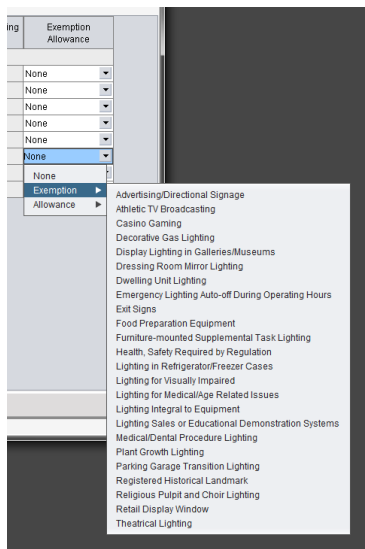


- ▶ Options menu
- ▶ Exemptions
 - Power for exempt fixtures is omitted from the **proposed wattage**
- ▶ Allowances
 - **Allowed wattage** for building increased by allowable amount



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Lighting: Exemptions and Allowances (cont)



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Exterior Lighting: Example



- ▶ Lighting applications entered similar to interior lighting
- ▶ Pay attention to tradable versus non-tradable criteria.

Building Envelope Area Types		Interior Lighting Method and Areas		Exterior Lighting Areas	
Exterior Lighting Zone: Neighborhood business district					
Add Delete Duplicate Help					
Exterior Lighting Area	Area Description	Quantity	Units	W/Unit	Tradable
1	Illuminated area of facade wall ...	500	ft2	0.1	No
2	Entry canopy	500	ft2	0.25	Yes
3	Other door (not main entry)	3	ft of doo...	20	Yes
4	Other door (not main entry)	3	ft of doo...	20	Yes
5	Parking area	10000	ft2	0.06	Yes

Comcheck Feed Store case study.ck - COMcheck 4.0.2.8 Code: 90.1 (2010) Standard									
File Edit View Options Code Help									
Project Envelope Interior Lighting Exterior Lighting Mechanical Requirements									
Add Fixture Fixture Library									
Component	Fixture ID	Fixture Description	Lamp Description/Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Track Lighting Wattage	Exemption
▼ Exterior Lighting Areas:									
1	Illuminated area of facade wall or surface (500 ft2)	Tradable Wattage: Allowed = 845 Proposed = 1098 Supplemental wattage: 600 (see Help for details)							
2	LED 2	Non-tradable Wattage: Allowed = 60 Proposed = 1144	LED Roadway/Pa...		1	20			None
3	Entry canopy (500 ft2)	Tradable Wattage: Allowed = 125 Proposed = 16	LED Linear 20W		1	4	4		None
4	Other door (not main entry) (3 ft of door width)	Tradable Wattage: Allowed = 60 Proposed = 35	High-Pressure So...	Standard	1	1	35.0		None
5	Other door (not main entry) (3 ft of door width)	Tradable Wattage: Allowed = 60 Proposed = 35	High-Pressure So...	Standard	1	1	35.0		None
6	Other door (not main entry) (3 ft of door width)	Tradable Wattage: Allowed = 60 Proposed = 35	High-Pressure So...	Standard	1	1	35.0		None
7	Parking area (10000 ft2)	Tradable Wattage: Allowed = 600 Proposed = 1000	High-Pressure So...	Standard	1	10	100.0		None
8									
9									
10									
Envelope = -2% Interior Lighting = +44% Exterior Lighting = TBC									
Fails: One or more non-tradable exterior lighting use areas fail									

Mechanical Systems



- ▶ Limited means to determine compliance
- ▶ Enter characteristics of
 - HVAC system
 - Plant
 - Water heating
- ▶ Characteristics you select determine which requirements apply



Project Envelope Interior Lighting Exterior Lighting Mechanical Requirements							
HVAC System Plant Water Heating Fan Systems							
Component	System Type	Quantity	Capacity	Cap. Units	Fuel Type/Heat Source	Conder Type	
Building							

Mechanical Systems



- ▶ Example of a typical duct furnace and split system

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
 Room Air Conditioner
 Single Package DX Unit
 Single Package Vertical AC Unit
 Split DX System
 VRF Zone Fan Unit
 Computer Room AC Unit
 Other

Zoning Category:
 Single Zone
 Multiple Zone
 Penetrator System
 Penetrator System

Example Lock - COMcheck 4.0.2.3 Code: 90.1 (2013) Standard

Component	System Type	Quantity	Capacity	Cap. Units	Fuel Type/ Heat Source	Condenser Type	System Details	Fan System Details	Proposed Efficiency	Ef Units	Minimum Efficiency
Building							Single zone system	Cooling fan system			
HVAC System 1	HVAC System	1									
Heating equipment	Duct Furnace	1	200	kBtu/h	Electric				--	--	--
Cooling equipment	Split System	1	300	kBtu/h		Air-Cooled	Air Economizer		10.00	EER	10.00 EER

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Mechanical: Fan Systems



- ▶ Determines Fan Power Limitations compliance for each fan system
- ▶ Motor nameplate HP and brake HP
 - Brake HP includes pressure drop credits as applicable

Fan System ID: Cooling fan system **Areas Served:**

Fan System Compliance Options
 Method: Motor Nameplate HP Brake HP Flow control devices installed on exhaust return to meet health, safety, environmental air pressure requirements in hospital, vivarium or laboratory systems.

Fan ID	Fan Type	Fan Control	Air Volume (CFM)	Motor Nameplate ...	Fan Efficiency	
1	FAN 1	Supply	Single-Zone VAV	20000.0	20.0	90.0

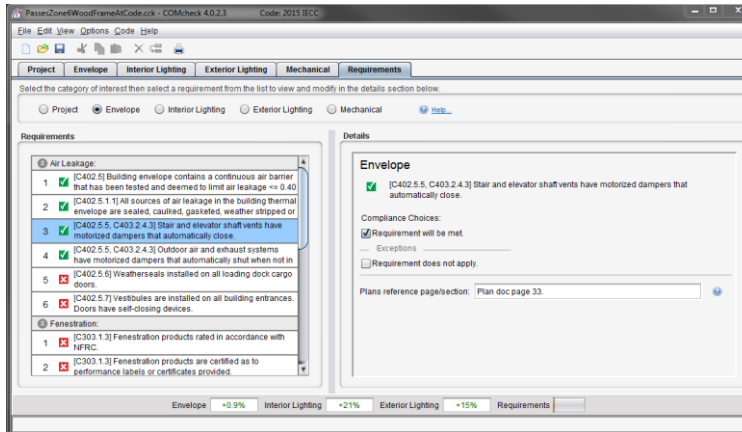
Compliance: Passes
 Proposed Motor Nameplate HP: 20.00 Max. Allowed: 22.00

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Requirements Tab – Goals



- ▶ Ensure user is aware of applicable mandatory requirements and addresses each in the software
- ▶ Provide better documentation for code officials



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Requirements Tab – How it Works



- ▶ For each requirement, the user
 - Certifies that a code requirement is
 - Met
 - Exempt
 - or does not apply
 - Notes how compliance for applicable requirements are documented
- ▶ This information is shown on the report in the “Comments/ Assumptions” column of the Inspection Checklist

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Reports



- ▶ **File** → **View / Print Report**
- ▶ **Choices, choose any or all**
 - Envelope Compliance Certificate Interior
 - Lighting Compliance Certificate Exterior
 - Lighting Compliance Certificate Mechanical
 - Compliance Certificate
- ▶ **First pages are the Compliance Certificate**
- ▶ **Follow-on pages are the Inspection Checklists by phase of inspection**
 - Plan Review
 - Footing/Foundation
 - Rough-in
 - Final

Report – Compliance Certificate



1 / 19 88.5% Tools Fill & Sign Comment

COMcheck Software Version 4.0.2.3 Envelope Compliance Certificate

Project Information

Energy Code:	2016 IECC	Designer/Contractor:	Jane Contractor
Project Title:	Project Demo	John Doe	Excel Contractors, Inc.
Location:	Bozeman, Montana	321 Example Ave.	Contractorville, MT 99999
Climate Zone:	6b	444-333-2222	999-888-9999
Project Type:	New Construction	example@example.com	email@email.com
Vertical Glazing / Wall Area:	30%		
Permit Date:	998877		
Permit No.:	XYZ		

Construction Site:	123 Main St	Mainville, MT 55515
Owner/Agent:	John Doe	Acme Real Estate Agency
Designer/Contractor:	Jane Contractor	Excel Contractors, Inc.

Building Area	Floor Area
"1-Law Library (Court House) - Nonresidential	10000

Additional Efficiency Package

Envelope Assemblies

Assembly	Gross Area of Perimeter	Cavity R-Value	Cost R-Value	Proposed U-Factor	Budget U-Factor
Floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Law Library]	10000	—	30.0	0.032	0.032
Slab: Slab-On-Grade Unheated, Vertical 2 R., [Bldg. Use 1 - Law Library] (c)	400	—	10.0	0.550	0.550
NORTH					
Exterior Wall 1: Wood-Framed, 24" o. c., [Bldg. Use 1 - Law Library]	1000	13.0	7.5	0.050	0.051
Window 1: Metal Frame Fixed, Perf. Specs., Product ID AX321, SHGC: 0.40, VT 0.44, [Bldg. Use 1 - Law Library] (b)	300	—	—	0.360	0.360
EAST					
Exterior Wall 2: Wood-Framed, 24" o. c., [Bldg. Use 1 - Law Library]	1000	13.0	7.5	0.050	0.051
Window 2 in wall: Metal Frame Fixed, Perf. Specs., Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Law Library] (b)	300	—	—	0.360	0.360
SOUTH					
Exterior Wall 4: Wood-Framed, 24" o. c., [Bldg. Use 1 - Law Library]	1000	13.0	7.5	0.050	0.051
Window 4 in wall 4: Metal Frame Operable, Perf. Specs., Product ID WWC, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Law Library] (b)	300	—	—	0.290	0.430
WEST					
Exterior Wall 3: Wood-Framed, 24" o. c., [Bldg. Use 1 - Law Library]	1000	13.0	7.5	0.050	0.051
Window 3 in wall 3: Metal Frame Fixed, Perf. Specs., Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Law Library] (b)	300	—	—	0.360	0.360

Project Title: Project Demo Report date: 12/07/15
 Data filename: C:\Users\j3870\BECPCheckApp\trunk\Engine\TestCases\2015Tests\Demo Files\Passes\Zone6\WoodFrameAtCode.cck Page 1 of 19

Reports – Compliance Certificate (cont)



COMcheck Software Version 4.0.2.3 Envelope Compliance Certificate

Project Information

Energy Code: 2015 IECC
 Project Title: Project Demo
 Location: Bozeman, Montana
 Climate Zone: 6b
 Project Type: New Construction
 Vertical Glazing / Wall Area: 30%
 Permit Date: 998877
 Permit No.: XYZ

Construction Site:
 123 Main St.
 Mainville, MT 59515

Owner/Agent:
 John Doe
 Acme Real Estate Agency
 321 Example Ave.
 Example, MT 99522
 444-333-2222
 example@example.com

Designer/Contractor:
 Jane Contractor
 Excel Contractors, Inc.
 444 Contractor Ave.
 Contractorville, MT 99999
 999-999-9999
 email@email.com

Building Area	Floor Area
1-Law library (Court House) : Nonresidential	10000

Additional Efficiency Package

On-site Renewable Energy

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor _{req}
Roof: Insulation Entirely Above Deck, [Bldg. Use 1 - Law library]	10000	—	30.0	0.032	0.032
Slab floor: Slab-On-Grade:Unheated, Vertical 2 ft., [Bldg. Use 1 - Law library] (c)	400	—	10.0	0.550	0.550
NORTH					
Exterior Wall 1: Wood-Framed, 24" o.c., [Bldg. Use 1 - Law library]	1000	13.0	7.5	0.050	0.051
Window 1: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Law library] (b)	300	—	—	0.360	0.360

Key Elements for Review

- Basic Project Details
- Envelope Specs, Dimensions

Reports – Compliance Certificate



Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor _{req}
Roof: Insulation Entirely Above Deck, [Bldg. Use 1 - Law library]	10000	—	30.0	0.032	
Slab floor: Slab-On-Grade:Unheated, Vertical 2 ft., [Bldg. Use 1 - Law library] (c)	400	—	10.0	0.550	
NORTH					
Exterior Wall 1: Wood-Framed, 24" o.c., [Bldg. Use 1 - Law library]	1000	13.0	7.5	0.050	
Window 1: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Law library] (b)	300	—	—	0.360	
EAST					
Exterior Wall 2: Wood-Framed, 24" o.c., [Bldg. Use 1 - Law library]	1000	13.0	7.5	0.050	
Window 2 in Wall2: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Law library] (b)	300	—	—	0.360	0.360

Verify area, insulation R-values, and U-factors consistent with plans

Verify Compliance Statement is Signed

Envelope PASSES: Design 1% better than code

Envelope Compliance Statement

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 systems have been designed to meet the 2015 IECC requirements in COMCHECK Version 4.0.2.3 and to comply with the mandatory requirements listed in the Inspection Checklist.

Name - Title _____ Signature _____ Date _____

Reports – Inspection Checklist



COMcheck Software Version 4.0.2.3

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 7.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR1] ²	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met. Location on plans/spec: Plan doc page 21, section 3a
C103.2 [PR2] ²	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Envelope Inspection Checklist Example



Code Section #

Value from Plans

Compliance



Section # & Req.ID	Footing / Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
5.5.3.3 [FO1] ²	Below-grade wall insulation R-value.	R-____	R-____	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.



Inspection Type and Req. Title



Value from Field



Plans ref., Insp. comments

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COMcheck Page

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U.S. DOE: BECP Resources



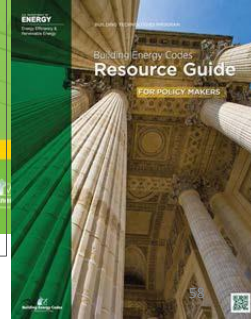
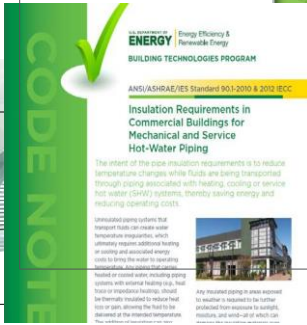
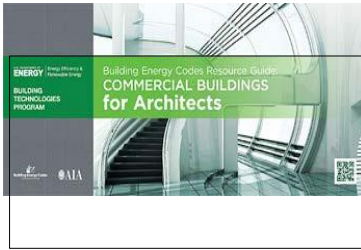
- ▶ Compliance software
 - ▶ Technical support
 - ▶ Code notes
 - ▶ Publications
 - ▶ Resource guides
 - ▶ Training materials
- www.energycodes.gov

The screenshot shows the COMcheck-Web interface with a table of components and a sidebar with resource guides.

Comp. Name	Assembly	Orientation	Building Area
1 Roof	Insulation: Gypsum Above Deck	North	1 - Area: 1,000 sq ft
2 Ext. Wall	Wood-Framed, 2x4-in. Ins.	North	1 - Area: 1,000 sq ft
3 Window	Wood-Framed, Double	North	1 - Area: 1,000 sq ft
4 Door	Insulated Metal	North	1 - Area: 1,000 sq ft

Resource Guides shown in the sidebar:

- Building Energy Codes Resource Guide for Architects
- Insulation Requirements in Commercial Buildings for Mechanical and Service Hot-Water Piping
- Building Energy Codes Resource Guide for Policy Makers



QUESTIONS



Energy Code Support



Questions about the energy code?

Energy Code Support Hotline:

855-757-9717

Energy Code Support Email:

energycodesma@psdconsulting.com

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We Speak  Building



Thanks!

Mike DeWein

Leidos Strategic Program Director

**Massachusetts Energy Code
Technical Support Program**



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