



COMcheck Basics

2022 Department of Energy National Energy Codes Conference
Building Energy Codes Program

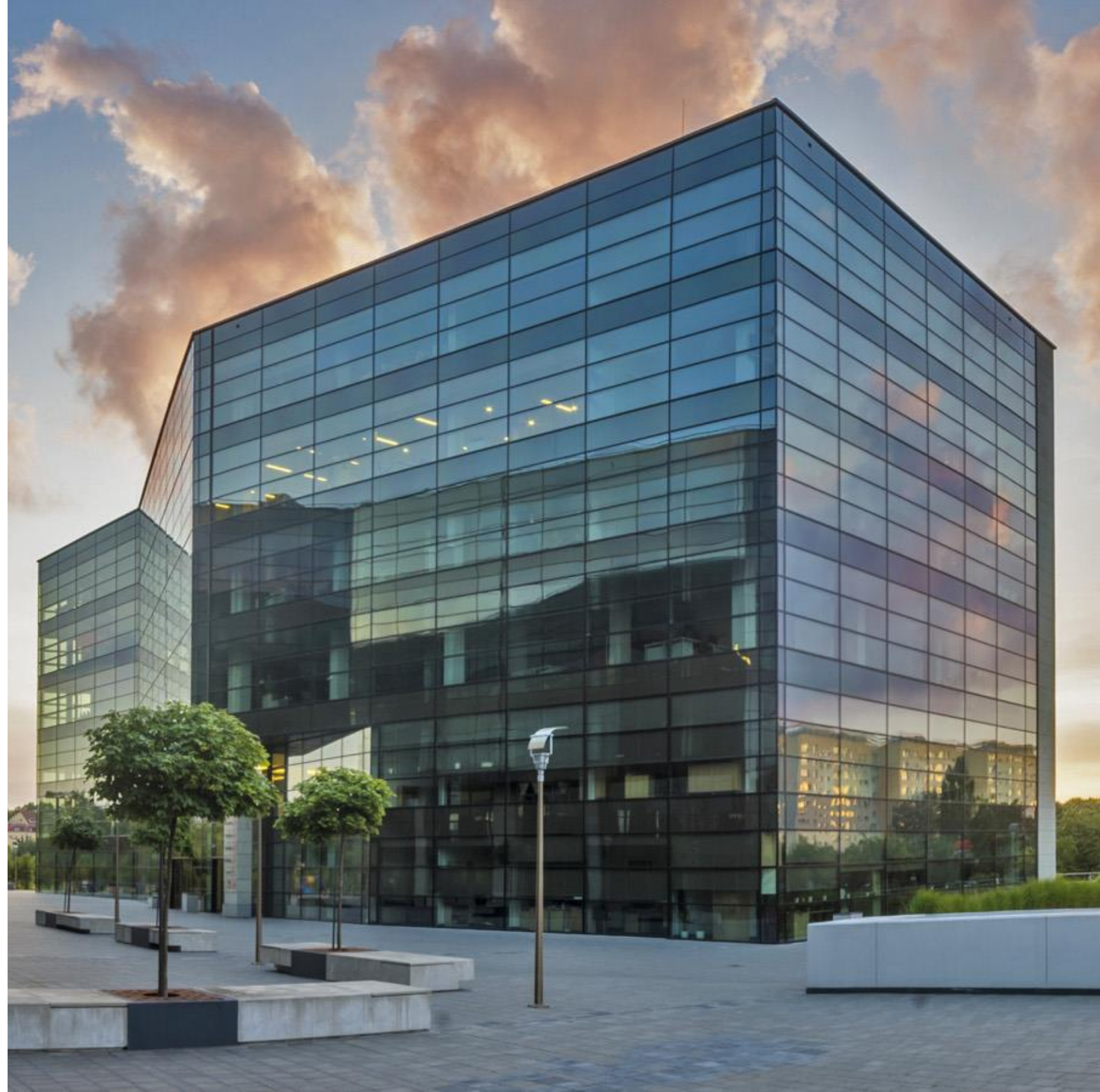
July 19, 2022

V. Robert Salcido
Senior Research Engineer

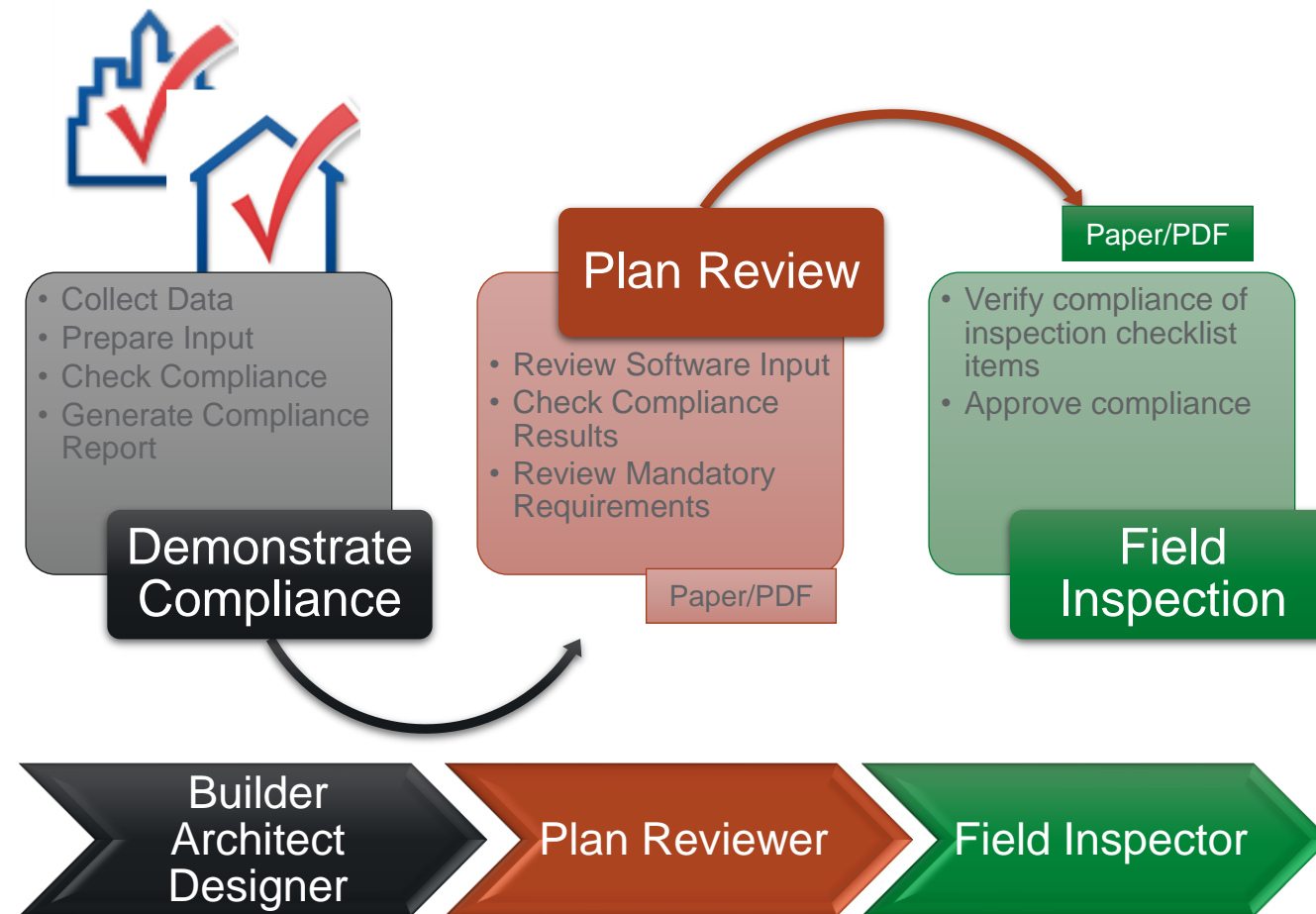


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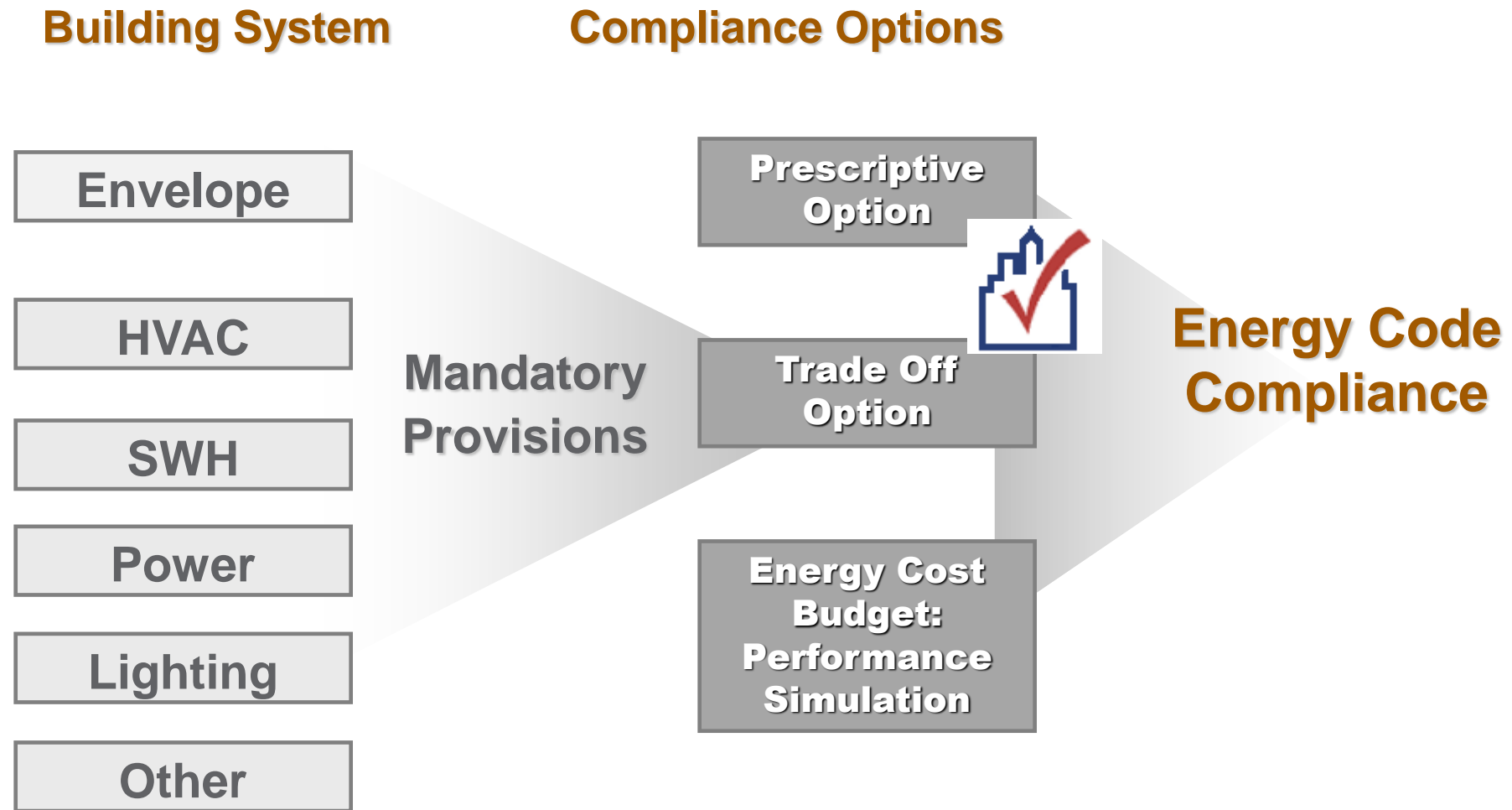


COMcheck Current Use Scenario



BECP Tools used only during “Demonstrate Compliance” Stage

COMcheck Compliance Methods



COMcheck Commercial Energy Codes



- ASHRAE 90.1 (Pre-2013) Normative Appendix C Methodology for Building Envelope Trade-Off Option
 - 90.1-2007/2010
 - 2009/2012 IECC
- ASHRAE 90.1-2013/2016/2019 Appendix C has limited performance method (EnergyPlus)
- 2015/2018/2021 IECC Component Performance Alternative (hybrid Total UA method)

Envelope Trade-Off Methods

90.1-2007/2010 and 2009/2012 IECC: Normative Appendix C Methodology for Building Envelope Trade-Off Option

- Building energy cost factor computed using regression equations
- 90.1-2007/2010: Window/wall and skylight/roof ratio limitations **enforced but tradable**
- 2009/2012 IECC: Window/wall and skylight/roof ratio limitations **enforced as hard limit**

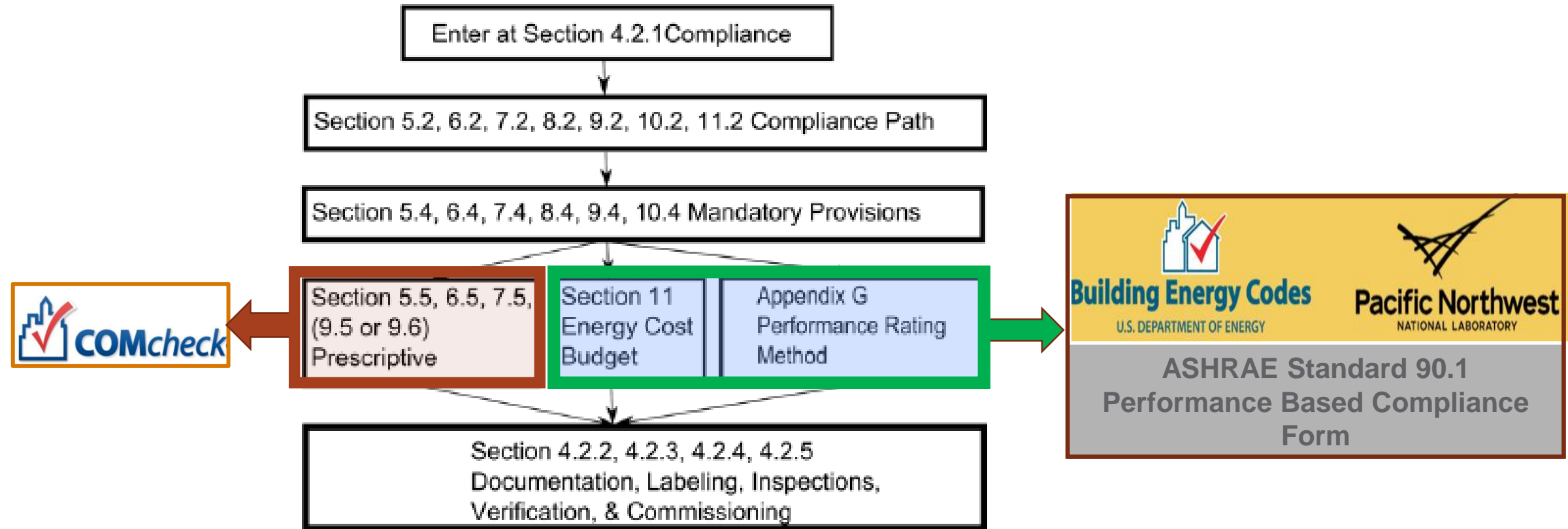
90.1-2013/2016/2019 Appendix C Envelope Trade-Off Methodology

- Envelope components are assigned to isolated thermal zones based on
 - Building Envelope Area Types (BEAT) play influential role
 - Space conditioning categories (SCC)
 - Window/wall and skylight/roof ratio limitations **enforced but tradable**

2015/2018/2021 IECC Component Performance Method Criteria

- Envelope assemblies must pass on 'hybrid' Total UA based criteria
- Window/wall and skylight/roof ratio limitations **enforced but tradable**
- SHGC prescriptive requirement enforced

ASHRAE Standard 90.1 Section 11 and Appendix G Compliance Documentation



<https://www.energycodes.gov/ashrae-standard-901-performance-based-compliance-form>

IECC Envelope Opaque Assembly Requirements

TABLE C402.1.4
OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, U-FACTOR METHOD^{a, b}

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	U-0.048	U-0.039	U-0.039	U-0.039	U-0.039	U-0.039	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.028	U-0.028	U-0.028	U-0.028
Metal buildings	U-0.044	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.031	U-0.031	U-0.029	U-0.029	U-0.029	U-0.029
Attic and other	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021
Walls, above grade																
Mass ^e	U-0.151	U-0.151	U-0.151	U-0.123	U-0.123	U-0.104	U-0.104	U-0.090	U-0.090	U-0.080	U-0.080	U-0.071	U-0.071	U-0.071	U-0.061	U-0.061
Metal building	U-0.079	U-0.079	U-0.079	U-0.079	U-0.079	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.052	U-0.039	U-0.052	U-0.039
Metal framed	U-0.077	U-0.077	U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.052	U-0.064	U-0.045
Wood framed and other ^c	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.036	U-0.036
Walls, below grade																
Below-grade wall ^c	C-1.140 ^o	C-1.140 ^o	C-1.140 ^o	C-1.140 ^o	C-1.140 ^o	C-1.140 ^o	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.092	C-0.092	C-0.092
Floors																
Mass ^d	U-0.322 ^o	U-0.322 ^o	U-0.107	U-0.087	U-0.076	U-0.076	U-0.076	U-0.074	U-0.074	U-0.064	U-0.064	U-0.064	U-0.055	U-0.051	U-0.055	U-0.051
Joist/framing	U-0.066 ^o	U-0.066 ^o	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033
Slab-on-grade floors																
Unheated slabs	F-0.73 ^o	F-0.73 ^o	F-0.73 ^o	F-0.73 ^o	F-0.73 ^o	F-0.73 ^o	F-0.54	F-0.54	F-0.54	F-0.54	F-0.54	F-0.52	F-0.40	F-0.40	F-0.40	F-0.40
Heated slabs ^f	F-1.02 0.74	F-1.02 0.74	F-1.02 0.74	F-1.02 0.74	F-0.90 0.74	F-0.90 0.74	F-0.86 0.64	F-0.86 0.64	F-0.79 0.64	F-0.79 0.64	F-0.79 0.55	F-0.69 0.55	F-0.69 0.55	F-0.69 0.55	F-0.69 0.55	F-0.69 0.55
Opaque doors																
Swinging door	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.61	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37
Garage door <14% glazing	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31

IECC Envelope Fenestration Requirements

TABLE C402.4
BUILDING ENVELOPE FENESTRATION MAXIMUM *U*-FACTOR AND SHGC REQUIREMENTS

CLIMATE ZONE	1	2	3	4 EXCEPT MARINE	5 AND MARINE 4	6	7	8
Vertical fenestration								
<i>U</i>-factor								
Fixed fenestration	0.50	0.50	0.46	0.38	0.38	0.36	0.29	0.29
Operable fenestration	0.65	0.65	0.60	0.45	0.45	0.43	0.37	0.37
Entrance doors	1.10	0.83	0.77	0.77	0.77	0.77	0.77	0.77
SHGC								
Orientation ^a	SEW	N	SEW	N	SEW	N	SEW	N
PF < 0.2	0.25	0.33	0.25	0.33	0.25	0.33	0.36	0.48
0.2 ≤ PF < 0.5	0.30	0.37	0.30	0.37	0.30	0.37	0.43	0.53
PF ≥ 0.5	0.40	0.40	0.40	0.40	0.40	0.40	0.58	0.58
Skylights								
<i>U</i> -factor	0.75	0.65	0.55	0.50	0.50	0.50	0.50	0.50
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

(Source: 2018 IECC)

90.1 Envelope Requirements

TABLE 5.5-6 Building Envelope Requirements for Climate Zone 6 (A, B)*

Opaque Elements	Nonresidential		Residential		Semiheated	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
<i>Roofs</i>						
Insulation Entirely above Deck	U-0.048	R-20.0 c.i.	U-0.048	R-20.0 c.i.	U-0.093	R-10.0 c.i.
Metal Building ^a	U-0.049	R-13.0 + R-19.0	U-0.049	R-13.0 + R-19.0	U-0.072	R-16.0
Attic and Other	U-0.027	R-38.0	U-0.027	R-38.0	U-0.034	R-30.0
<i>Walls, Above-Grade</i>						
Mass	U-0.080	R-13.3 c.i.	U-0.071	R-15.2 c.i.	U-0.151 ^b	R-5.7 c.i. ^b
Metal Building	U-0.069	R-13.0 + R-5.6 c.i.	U-0.069	R-13.0 + R-5.6 c.i.	U-0.113	R-13.0
Steel-Framed	U-0.064	R-13.0 + R-7.5 c.i.	U-0.064	R-13.0 + R-7.5 c.i.	U-0.124	R-13.0
Wood-Framed and Other	U-0.051	R-13.0 + R-7.5 c.i.	U-0.051	R-13.0 + R-7.5 c.i.	U-0.089	R-13.0
<i>Walls, Below-Grade</i>						
Below-Grade Wall	C-0.119	R-7.5 c.i.	C-0.119	R-7.5 c.i.	C-1.140	NR
<i>Floors</i>						
Mass	U-0.064	R-12.5 c.i.	U-0.057	R-14.6 c.i.	U-0.137	R-4.2 c.i.
Steel-Joist	U-0.038	R-30.0	U-0.032	R-38.0	U-0.052	R-19.0
Wood-Framed and Other	U-0.033	R-30.0	U-0.033	R-30.0	U-0.051	R-19.0
<i>Slab-On-Grade Floors</i>						
Unheated	F-0.540	R-10 for 24 in.	F-0.520	R-15 for 24 in.	F-0.730	NR
Heated	F-0.860	R-15 for 24 in.	F-0.688	R-20 for 48 in.	F-1.020	R-7.5 for 12 in.
<i>Opaque Doors</i>						
Swinging	U-0.700		U-0.500		U-0.700	
Nonswinging	U-0.500		U-0.500		U-1.450	
Fenestration						
	Assembly Max. U	Assembly Max. SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Max. U	Assembly Max. SHGC
<i>Vertical Glazing, 0%–40% of Wall</i>						
Nonmetal framing (all) ^c	U-0.35		U-0.35		U-0.65	
Metal framing (curtainwall/storefront) ^d	U-0.45	SHGC-0.40 all	U-0.45	SHGC-0.40 all	U-0.60	SHGC-NR all
Metal framing (entrance door) ^d	U-0.80		U-0.80		U-0.90	
Metal framing (all other) ^d	U-0.55		U-0.55		U-0.65	
<i>Skylight with Curb, Glass, % of Roof</i>						
0%–2.0%	U _{all} -1.17	SHGC _{all} -0.49	U _{all} -0.98	SHGC _{all} -0.46	U _{all} -1.98	SHGC _{all} -NR
2.1%–5.0%	U _{all} -1.17	SHGC _{all} -0.49	U _{all} -0.98	SHGC _{all} -0.36	U _{all} -1.98	SHGC _{all} -NR
<i>Skylight with Curb, Plastic, % of Roof</i>						
0%–2.0%	U _{all} -0.87	SHGC _{all} -0.71	U _{all} -0.74	SHGC _{all} -0.65	U _{all} -1.90	SHGC _{all} -NR
2.1%–5.0%	U _{all} -0.87	SHGC _{all} -0.58	U _{all} -0.74	SHGC _{all} -0.55	U _{all} -1.90	SHGC _{all} -NR
<i>Skylight without Curb, All, % of Roof</i>						
0%–2.0%	U _{all} -0.69	SHGC _{all} -0.49	U _{all} -0.58	SHGC _{all} -0.49	U _{all} -1.36	SHGC _{all} -NR
2.1%–5.0%	U _{all} -0.69	SHGC _{all} -0.49	U _{all} -0.58	SHGC _{all} -0.39	U _{all} -1.36	SHGC _{all} -NR

Source: 90.1-2010

90.1 Envelope Opaque Assembly Requirements

TABLE 5.5-6 Building Envelope Requirements for Climate Zone 6 (A, B)*

Opaque Elements	Nonresidential		Residential		Semiheated	
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value
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Metal Building	U-0.069	R-13.0 + R-5.6 c.i.	U-0.069	R-13.0 + R-5.6 c.i.	U-0.113	R-13.0
Steel-Framed	U-0.064	R-13.0 + R-7.5 c.i.	U-0.064	R-13.0 + R-7.5 c.i.	U-0.124	R-13.0
Wood-Framed and Other	U-0.051	R-13.0 + R-7.5 c.i.	U-0.051	R-13.0 + R-7.5 c.i.	U-0.089	R-13.0
<i>Walls, Below-Grade</i>						
Below-Grade Wall	C-0.119	R-7.5 c.i.	C-0.119	R-7.5 c.i.	C-1.140	NR
<i>Floors</i>						
Mass	U-0.064	R-12.5 c.i.	U-0.057	R-14.6 c.i.	U-0.137	R-4.2 c.i.
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<i>Slab-On-Grade Floors</i>						
Unheated	F-0.540	R-10 for 24 in.	F-0.520	R-15 for 24 in.	F-0.730	NR
Heated	F-0.860	R-15 for 24 in.	F-0.688	R-20 for 48 in.	F-1.020	R-7.5 for 12 in.
<i>Opaque Doors</i>						
Swinging	U-0.700		U-0.500		U-0.700	
Nonswinging	U-0.500		U-0.500		U-1.450	

Source: 90.1-2010

Project Types

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



Lighting Compliance Methods

- Mandatory requirements: Controls, Switching, Daylighting
- Interior/Exterior lighting power requirements
 - Complies if total connected power \leq lighting power allowance



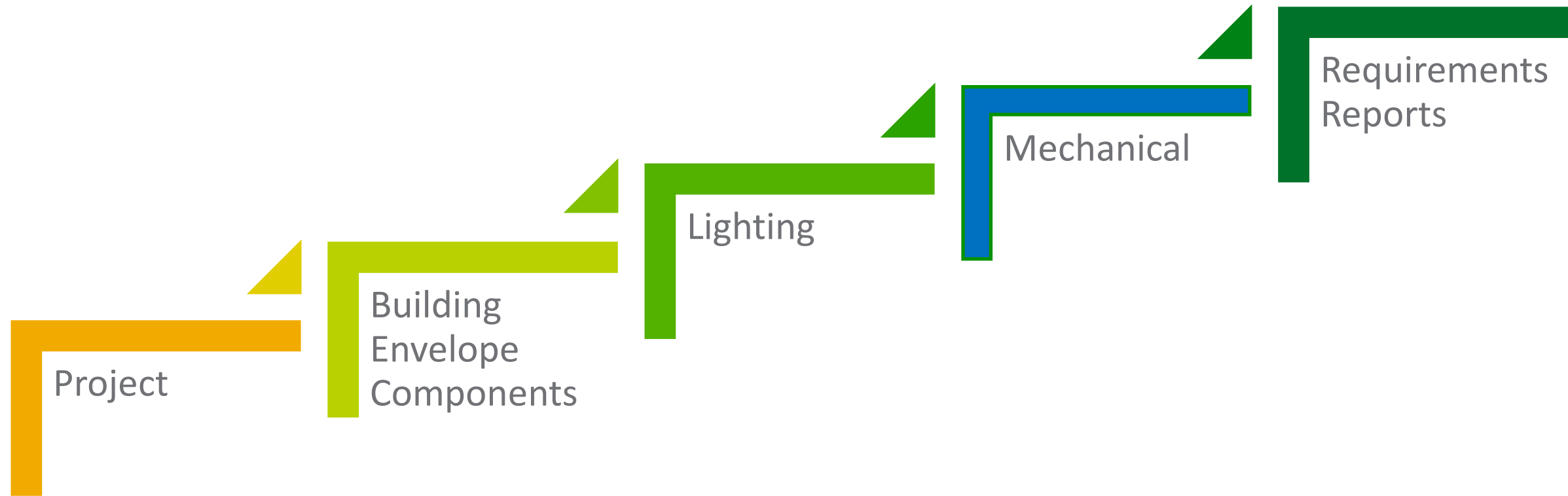
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Mechanical/Service Hot Water Compliance

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

COMcheck 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
- ▶ Interior/Exterior lighting fixture details
- ▶ Heating and cooling system details
- ▶ Service water heating details


2022 National Energy Codes Conference
The 2022 National Energy Codes Conference, hosted by the U.S. Department of Energy, will be virtual. Join us July 19-21!

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Tools


COMcheck
The COMcheck software and web tools simplify and clarify energy code compliance with the IECC, standard (ASHRAE Standard 90.1), and a number of state-specific energy codes.
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REScheck
The REScheck software and web tools simplify residential energy code compliance by automating trade-off calculations for the IECC and a number of state-specific codes.
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Submit technical questions about building energy codes, REScheck or COMcheck projects, or BECP website content.
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State Energy Codes




Highlights

- 

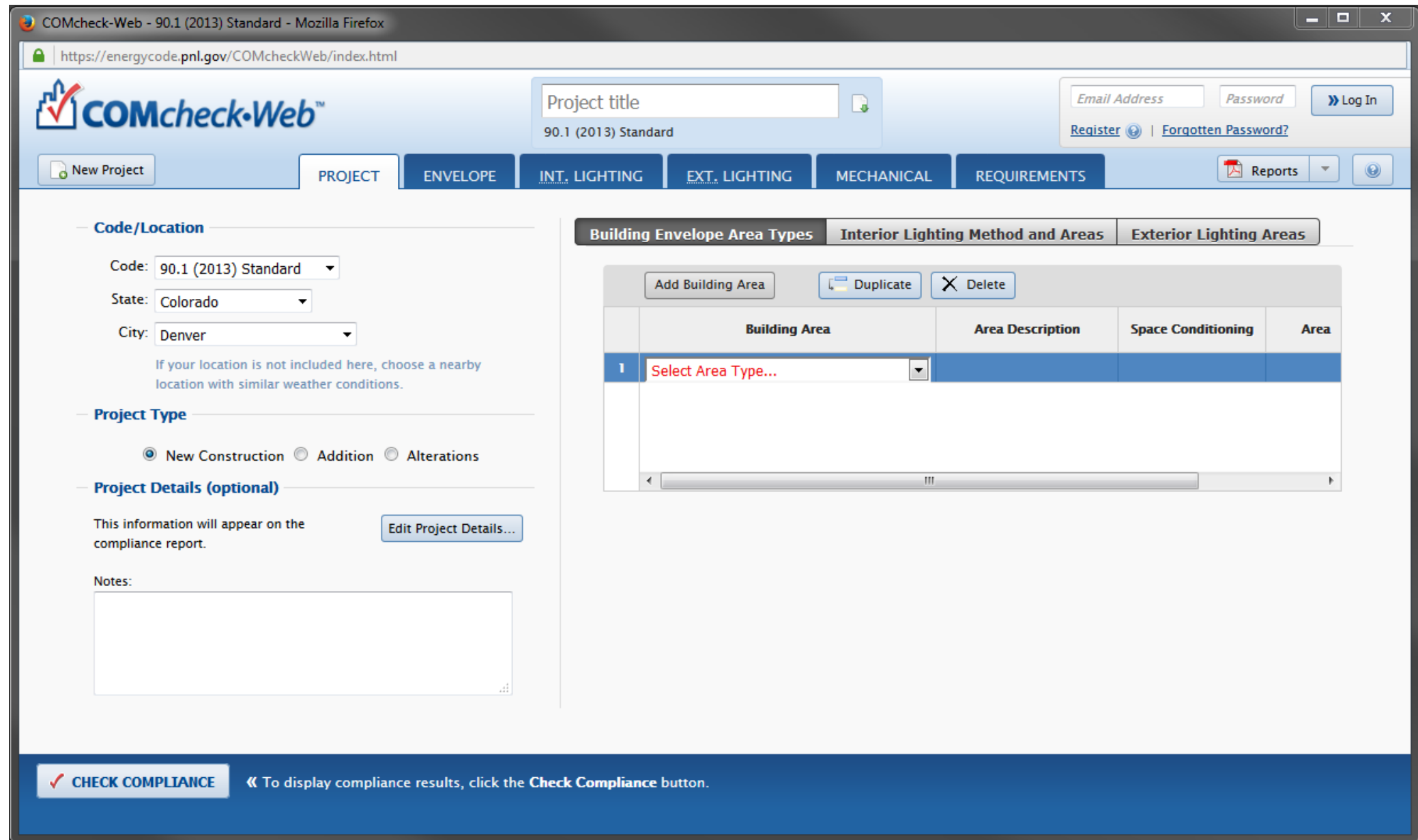
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COMcheck



COMcheck-Web - 90.1 (2013) Standard - Mozilla Firefox

https://energycode.pnl.gov/COMcheckWeb/index.html

Project title: 90.1 (2013) Standard

Email Address: Password: Log In

Register | Forgotten Password?

New Project PROJECT ENVELOPE INT. LIGHTING EXT. LIGHTING MECHANICAL REQUIREMENTS Reports

Code/Location

Code: 90.1 (2013) Standard

State: Colorado

City: Denver

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...

Notes:

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

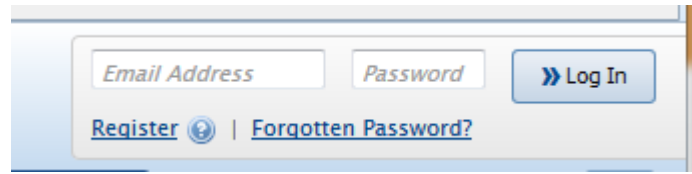
Add Building Area Duplicate Delete

	Building Area	Area Description	Space Conditioning	Area
1	Select Area Type...			

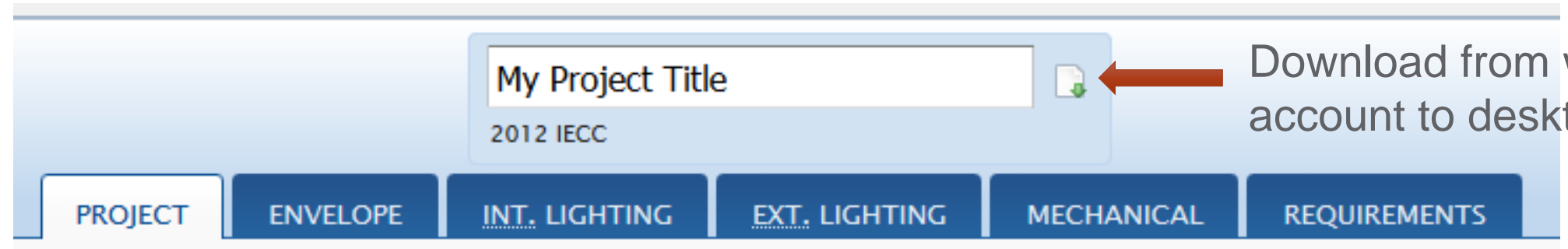
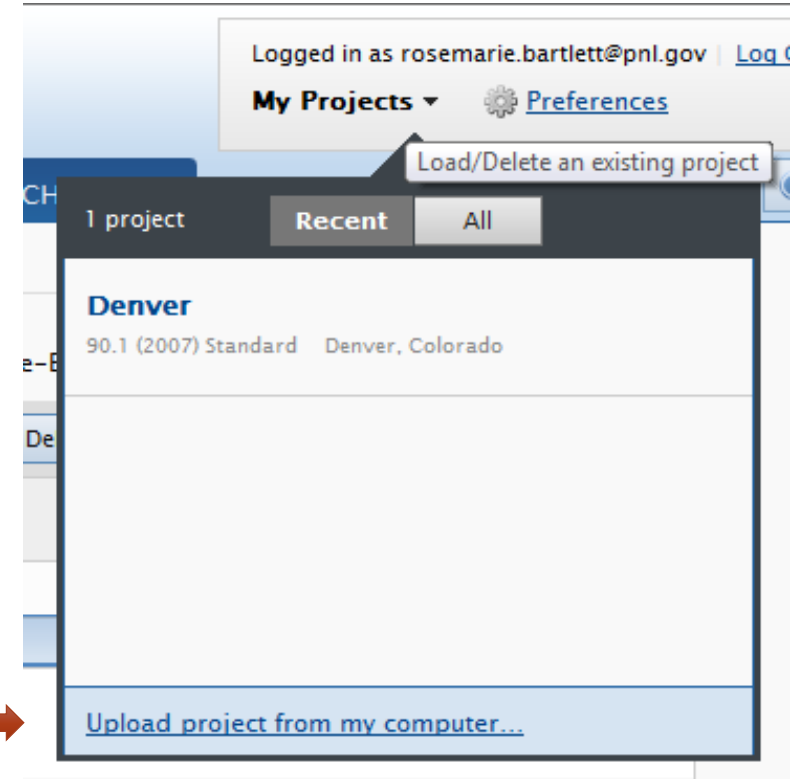
CHECK COMPLIANCE « To display compliance results, click the Check Compliance button.

Desktop/Web Data Exchange

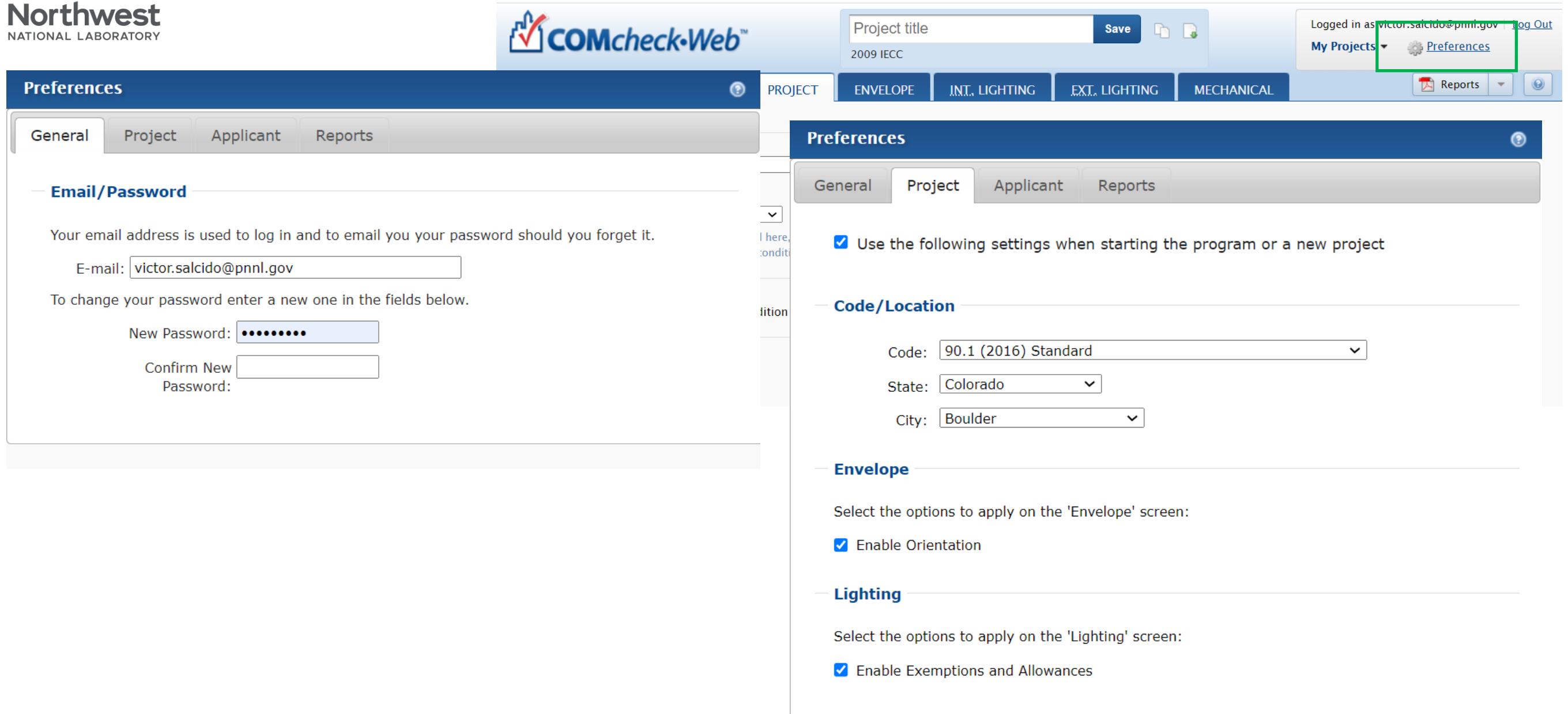
- ▶ Can exchange files between desktop and web
 - Log in to web
 - My Projects



Upload from desktop to web account



COMcheck Basics: Preferences



COMcheck-Web™

Project title: 2009 IECC

Logged in as victor.salcido@pnnl.gov | Log Out

My Projects | Preferences

Reports

Preferences

General | Project | Applicant | Reports

Email/Password

Your email address is used to log in and to email you your password should you forget it.

E-mail: victor.salcido@pnnl.gov

To change your password enter a new one in the fields below.

New Password: ●●●●●●

Confirm New Password:

Code/Location

Code: 90.1 (2016) Standard

State: Colorado

City: Boulder

Envelope

Select the options to apply on the 'Envelope' screen:


Enable Orientation

Lighting

Select the options to apply on the 'Lighting' screen:

Enable Exemptions and Allowances

COMcheck Basics: Preferences (cont)



Project title Save

Logged in as victor.salcido@pnnl.gov [Log Out](#)
My Projects Preferences

Preferences

PROJECT
ENVELOPE
INT., LIGHTING
EXT., LIGHTING
MECHANICAL

General

Project

Applicant

Reports

Applicant Information

Enter any of the following information to use when starting the program or a new project.

Owner/Agent	Designer/Contractor
First Name: <input style="width: 80%;" type="text"/> Last Name: <input style="width: 80%;" type="text"/> Company: <input style="width: 90%;" type="text"/> Address: <input style="width: 90%;" type="text"/> City: <input style="width: 80%;" type="text"/> State: Alabama ▼ Zip Code: <input style="width: 60%;" type="text"/> Phone #: <input style="width: 80%;" type="text"/> E-mail: <input style="width: 90%;" type="text"/>	First Name: <input style="width: 80%;" type="text"/> Last Name: <input style="width: 80%;" type="text"/> Company: <input style="width: 90%;" type="text"/> Address: <input style="width: 90%;" type="text"/> City: <input style="width: 80%;" type="text"/> State: Alabama ▼ Zip Code: <input style="width: 60%;" type="text"/> Phone #: <input style="width: 80%;" type="text"/> E-mail: <input style="width: 90%;" type="text"/>

Report Signatures

Each COMcheck-Web report has a signature line that appears as follows:

Name - Title	Signature	Date

Enter a name and title to display on the 'Name-Title' line of each report (optional).

Envelope Report:

Interior Lighting Report:

Exterior Lighting Report:

Mechanical Report:

Email Reports

Enter any of the following information to use when emailing reports.

Recipient Name(s):

Recipient Email Address(es):

Email Address(es) for CC:

Project Screen

Project title
2018 IECC

Email Address Password Log In
Register | Forgotten Password?

New Project

PROJECT

ENVELOPE

INT. LIGHTING

EXT. LIGHTING

MECHANICAL

REQUIREMENTS

Reports

Code/Location

Code: 2018 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

Compliance Options

Efficiency: Enhanced Envelope Performance

Project Details (optional)

This information will appear on the compliance report.

Edit Project Details...

Notes:

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

Add Building Area Duplicate Delete

	Building Area	Area Description	Space Conditioning	Area	W/ft ²
1	Exercise Center		Nonresidential	10000 ft ²	0.65

Select Code and Location

Project: Project Type

- ▶ New Construction
- ▶ Addition
- ▶ Alteration



— Project Type

New Construction Addition Alterations



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

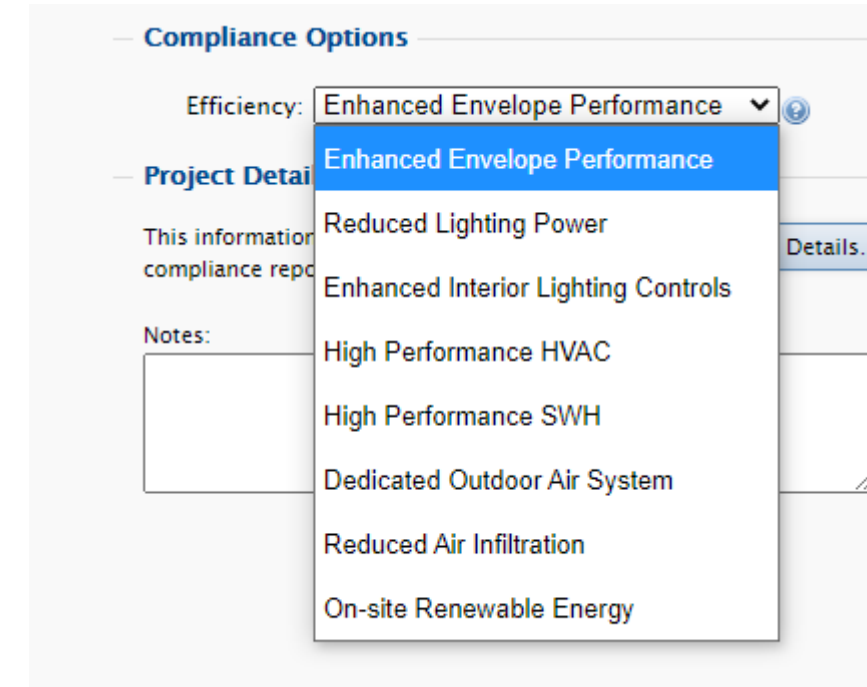
Compliance Options (IECC)

▶ Efficiency Options

- High performance power (2012/2015/2018)
- Reduced lighting power (2012/2015/2018)
- On-site renewable energy (2012/2015/2018)
- High performance SWH (2015/2018)
- Enhanced interior lighting controls (2015/2018)
- Dedicated outdoor air system (2015/2018)
- Enhanced Envelope Performance (2018)
- Reduced Air Infiltration (2018)

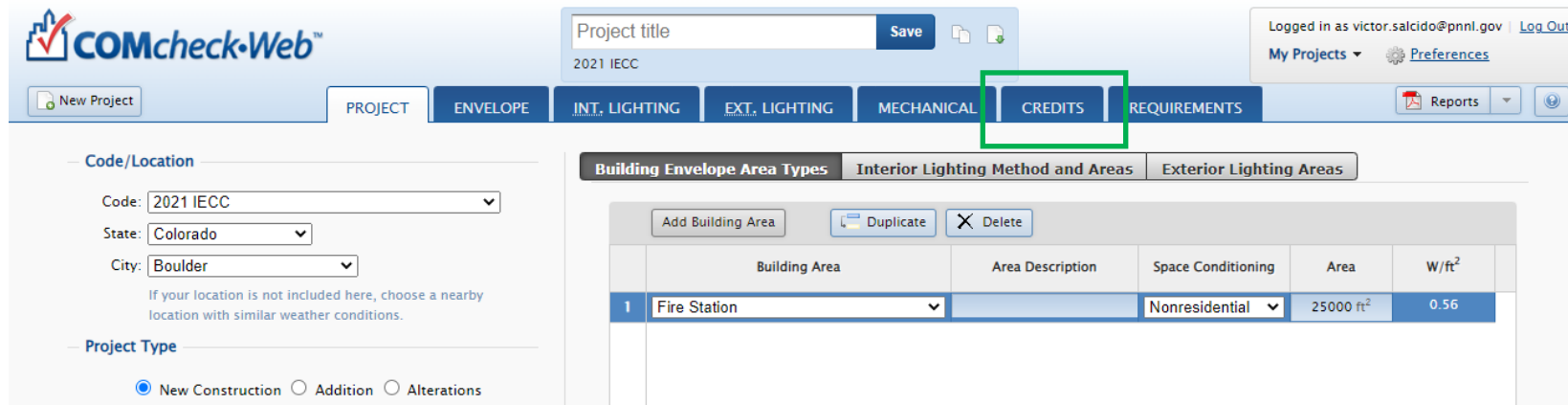
▶ Air Barrier Options (IECC 2012+, climate zone dependent)

- Air barrier permeability
- Assembly permeability
- Air leakage test



Compliance Options (2021 IECC only)

- ▶ Additional Efficiency Requirements (2021 IECC)
 - Added efficiency credit requirements based on occupancy type



COMcheck-Web™

Project title: 2021 IECC

Logged in as victor.salcido@pnnl.gov | Log Out

My Projects | Preferences

Code/Location: 2021 IECC, Colorado, Boulder

Project Type: New Construction Addition Alterations

Building Area	Area Description	Space Conditioning	Area	W/ft²
1	Fire Station	Nonresidential	25000 ft²	0.56



COMcheck-Web™

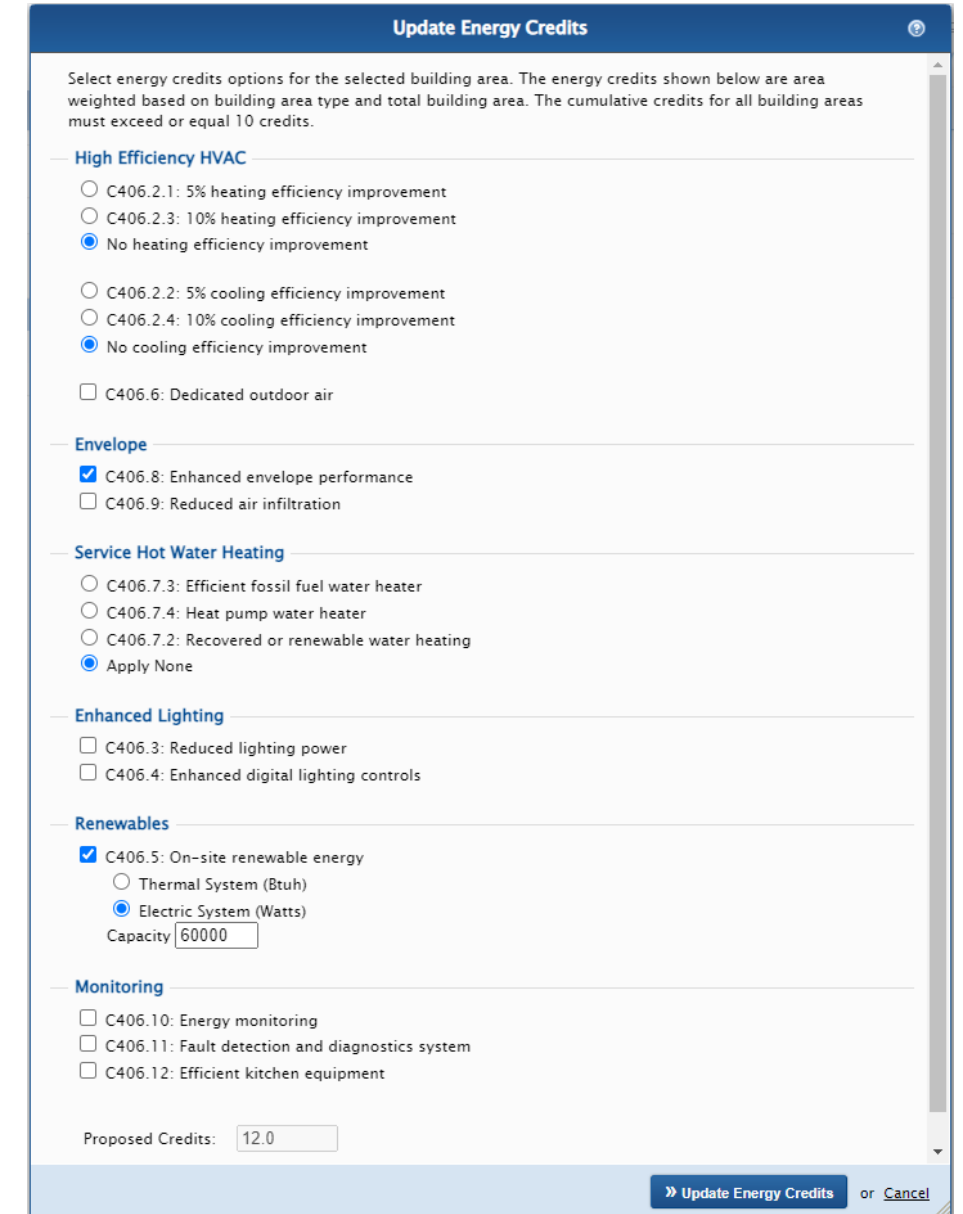
Project title: 2021 IECC Testing

Logged in as victor.salcido@pnnl.gov | Log Out

My Projects | Preferences

Credits: 10 Required 12 Proposed

Component	Credits
1 Court House (100000 ft²)	Edit...
2 Enhanced envelope performance	5.0
3 On-site renewable energy	7.0



Update Energy Credits

Select energy credits options for the selected building area. The energy credits shown below are area weighted based on building area type and total building area. The cumulative credits for all building areas must exceed or equal 10 credits.

High Efficiency HVAC

- C406.2.1: 5% heating efficiency improvement
- C406.2.3: 10% heating efficiency improvement
- No heating efficiency improvement
- C406.2.2: 5% cooling efficiency improvement
- C406.2.4: 10% cooling efficiency improvement
- No cooling efficiency improvement
- C406.6: Dedicated outdoor air

Envelope

- C406.8: Enhanced envelope performance
- C406.9: Reduced air infiltration

Service Hot Water Heating

- C406.7.3: Efficient fossil fuel water heater
- C406.7.4: Heat pump water heater
- C406.7.2: Recovered or renewable water heating
- Apply None

Enhanced Lighting

- C406.3: Reduced lighting power
- C406.4: Enhanced digital lighting controls

Renewables

- C406.5: On-site renewable energy
 - Thermal System (Btuh)
 - Electric System (Watts)
- Capacity: 60000

Monitoring

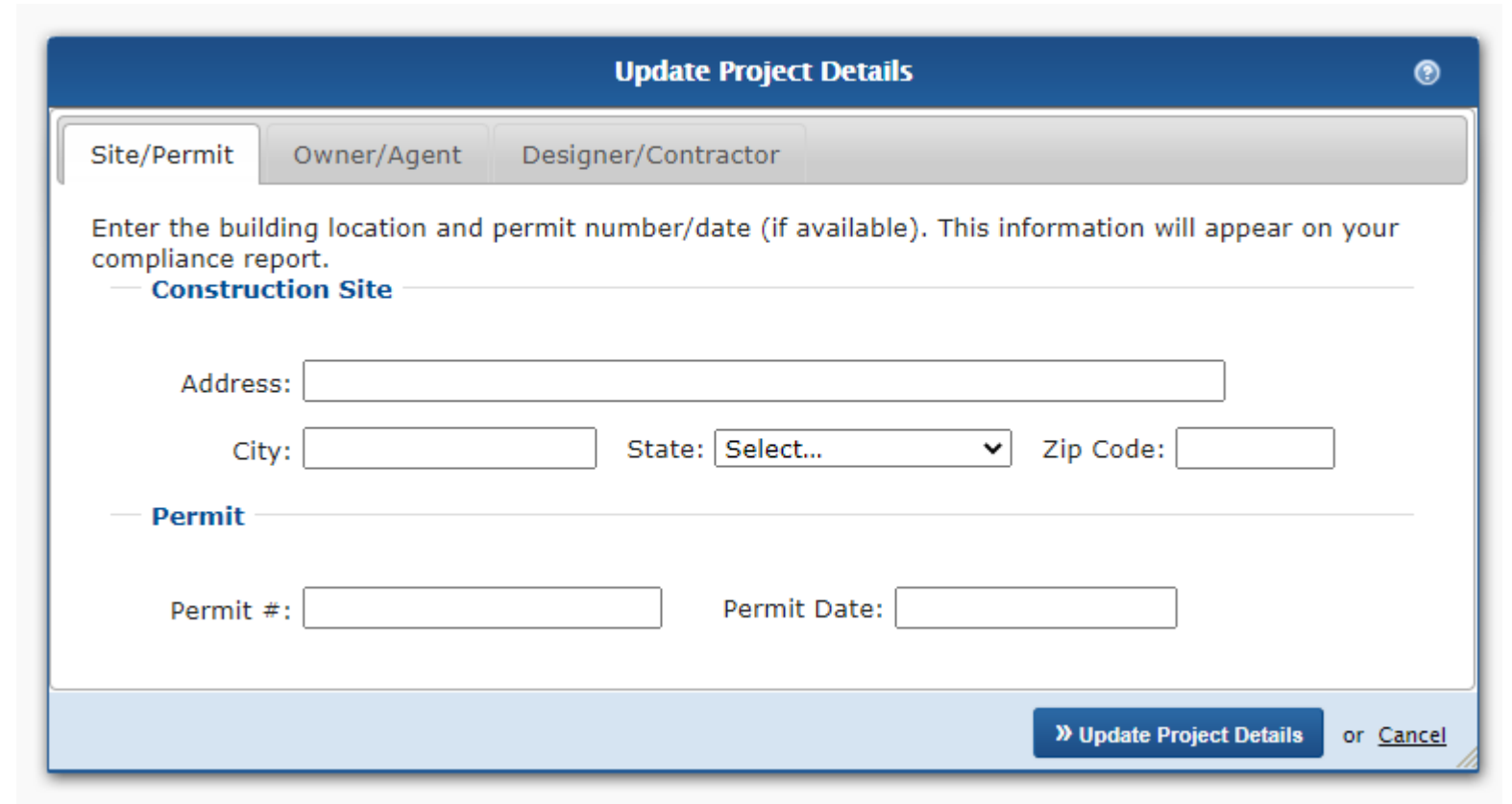
- C406.10: Energy monitoring
- C406.11: Fault detection and diagnostics system
- C406.12: Efficient kitchen equipment

Proposed Credits: 12.0

[Update Energy Credits](#) or [Cancel](#)

Project: Project Details

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



The screenshot shows a web form titled "Update Project Details" with a blue header and a light blue footer. The form has three tabs: "Site/Permit" (selected), "Owner/Agent", and "Designer/Contractor". Below the tabs, there is a text instruction: "Enter the building location and permit number/date (if available). This information will appear on your compliance report." The form is divided into two sections: "Construction Site" and "Permit". The "Construction Site" section includes an "Address:" text box, a "City:" text box, a "State:" dropdown menu with "Select..." as the current selection, and a "Zip Code:" text box. The "Permit" section includes a "Permit #:" text box and a "Permit Date:" text box. At the bottom right of the form, there is a blue button labeled "» Update Project Details" and a link labeled "or Cancel".

Project: Building Envelope 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 Envelope Area Types		Interior Lighting Method and Areas		Exterior Lighting Areas		
<input type="button" value="Add Building Area"/> <input type="button" value="Duplicate"/> <input type="button" value="Delete"/>						
	Building Area	Area Description	Space Conditioning	Area	W/ft ²	
1	Exercise Center		Nonresidential	10000 ft ²	0.72	
2	Office		Nonresidential	250 ft ²	0.64	
3	Parking Garage		Semiheated	2000 ft ²	0.18	

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

Add Area Category
Edit
Duplicate
Delete

	Area Category	Area Description	Area	Ceiling Height	W/ft ²
1	Parking Garage: Garage Area		1000 ft ²	N/A	0.15
2	Common Space Types: Office – Enclosed >2...		252 ft ²	N/A	0.66
3	Gymnasium/Fitness Center: Exercise Area		10000 ft ²	N/A	0.9

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

Add Building Area Duplicate Delete

	Building Area	Area Description	Space Conditioning	Area	W/ft ²
1	Exercise Center		Nonresidential	10000 ft ²	0.72
2	Office		Nonresidential	250 ft ²	0.64
3	Parking Garage		Semiheated	2000 ft ²	0.18

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 Area Category Edit Duplicate Delete

	Area Category	Area Description	Area	Ceiling Height	W/ft ²
1	Parking Garage: Garage Area		1000 ft ²	N/A	0.15
2	Common Space Types: Office - Enclosed >2...		252 ft ²	N/A	0.66
3	Gymnasium/Fitness Center: Exercise Area		10000 ft ²	N/A	0.9

Building Energy Codes Program

Project: Exterior Lighting Area Types

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

Zone: Unspecified

- Unspecified
- Residentially zoned area (LZ2)
- Residential mixed use area (LZ2)
- Neighborhood business district (LZ2)
- High activity metropolitan commercial district (LZ4)
- Light industrial area with limited nighttime use (LZ2)
- Developed area in national or state park (LZ1)
- Developed area on forest land (LZ1)
- Developed rural area (LZ1)
- Undeveloped area (LZ0)
- Other (LZ3)

Quantity	W/Unit	Tradable
----------	--------	----------

▶ Zone and area type determine:

- Lighting power density
- Units
- Tradability

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

Zone: High activity metropolitan commercial district (LZ4)

Add Exterior Area Duplicate Delete

Exterior Lighting Area	Area Description	Quantity	W/Unit	Tradable
1	Parking area	1000 ft ²	0.08	Yes

Envelope: Introduction



example 901

Save

90.1 (2019) Standard

Logged in as rosemarie.bartlett@pnnl.gov | [Log Out](#)

[My Projects](#) | [Preferences](#)

New Project

PROJECT

ENVELOPE

INT. LIGHTING

EXT. LIGHTING

MECHANICAL

REQUIREMENTS

Reports

Options

Row: [Edit](#) [Duplicate](#) [Move Up](#) [Move Down](#) [Delete](#)

Add: [Roof](#) [Skylight](#) [Ext. Wall](#) [Int. Wall](#) [Window](#) [Door](#) [Basement](#) [Floor](#)

Component	Assembly	Orientation	Building Area Type	Fenestration Details	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	VT	SHGC	Projection Factor
-----------	----------	-------------	--------------------	----------------------	----------------------	------------	---------------------------	-------------------------------	----------	----	------	-------------------

Use the Component Buttons above to create a description of your building.

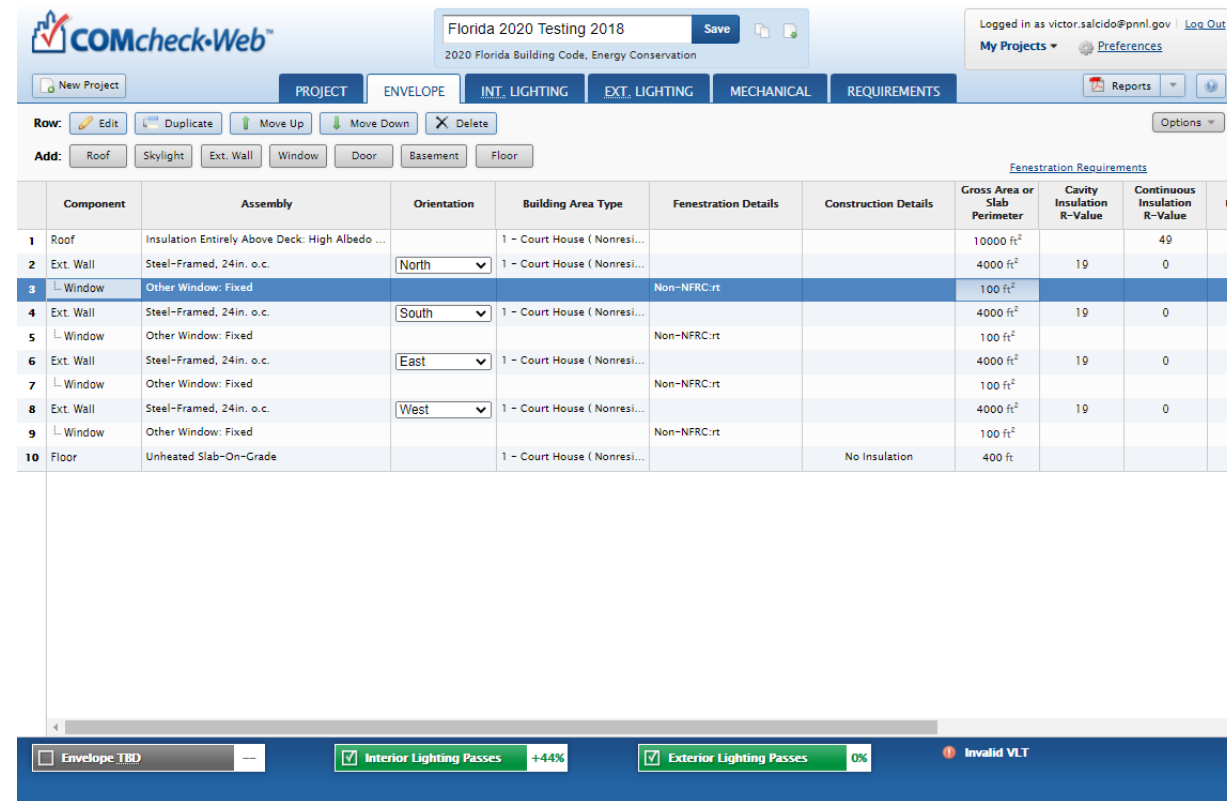
[CHECK COMPLIANCE](#)

« To display compliance results, click the **Check Compliance** button.

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

Envelope: Opaque Assemblies

- ▶ After you've entered building components, look at compliance result
 - Look for fields with red text
 - If TBD, look for missing data



The screenshot shows the COMcheck-Web interface for a project named "Florida 2020 Testing 2018". The "ENVELOPE" tab is selected. A table lists building components with their assemblies, orientations, and compliance results. The "Envelope" result is shown as "TBD" (To Be Determined) in red text, while "Interior Lighting" and "Exterior Lighting" are shown as "Passes" with green checkmarks.

Component	Assembly	Orientation	Building Area Type	Fenestration Details	Construction Details	Gross Area or Slab Perimeter	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Value
1 Roof	Insulation Entirely Above Deck: High Albedo ...		1 - Court House (Nonresi...			10000 ft ²	49		
2 Ext. Wall	Steel-Framed, 24in. o.c.	North	1 - Court House (Nonresi...			4000 ft ²	19	0	0
3 L. Window	Other Window: Fixed			Non-NFRC:rt		100 ft ²			
4 Ext. Wall	Steel-Framed, 24in. o.c.	South	1 - Court House (Nonresi...			4000 ft ²	19	0	0
5 L. Window	Other Window: Fixed			Non-NFRC:rt		100 ft ²			
6 Ext. Wall	Steel-Framed, 24in. o.c.	East	1 - Court House (Nonresi...			4000 ft ²	19	0	0
7 L. Window	Other Window: Fixed			Non-NFRC:rt		100 ft ²			
8 Ext. Wall	Steel-Framed, 24in. o.c.	West	1 - Court House (Nonresi...			4000 ft ²	19	0	0
9 L. Window	Other Window: Fixed			Non-NFRC:rt		100 ft ²			
10 Floor	Unheated Slab-On-Grade		1 - Court House (Nonresi...		No Insulation	400 ft			

At the bottom of the interface, the compliance summary shows:

- Envelope: TBD
- Interior Lighting Passes: +44%
- Exterior Lighting Passes: 0%
- Invalid VLT

Envelope: Fenestration

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

Performance data options

NFRC site-built certified product (commercial products only)

CPD ID [Search NFRC database for CPD ID.....](#)

U-Factor

SHGC

VT

Product performance evaluated in accordance with NFRC

Energy code default(s)

Performance data options

NFRC site-built certified product (commercial products only)

Product performance evaluated in accordance with NFRC

Enter following values for overall product.

U-Factor

SHGC

VT

Product ID (e.g., certificationID, pending ID, product label)

Energy code default(s)

Performance data options

NFRC site-built certified product (commercial products only)

Product performance evaluated in accordance with NFRC

Energy code default(s)

Glazing type

Solar coating type

U-Factor

SHGC

VT

Envelope: Summary

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

Diagnostic Data on Envelope Report



COMcheck Software Version COMcheckWeb Envelope Compliance Certificate

Project Information

Energy Code: 90.1 (2019) Standard
 Project Title: example 901
 Location: Aberdeen, Idaho
 Climate Zone: 6b
 Project Type: New Construction
 Performance Sim. Specs: EnergyPlus 8.1.0.009 (EPW: USA_ID_Pocatello.Muni.AP.725780_TMY3.epw)

Construction Site:

Owner/Agent:

Designer/Contractor:

Building Area

Floor Area

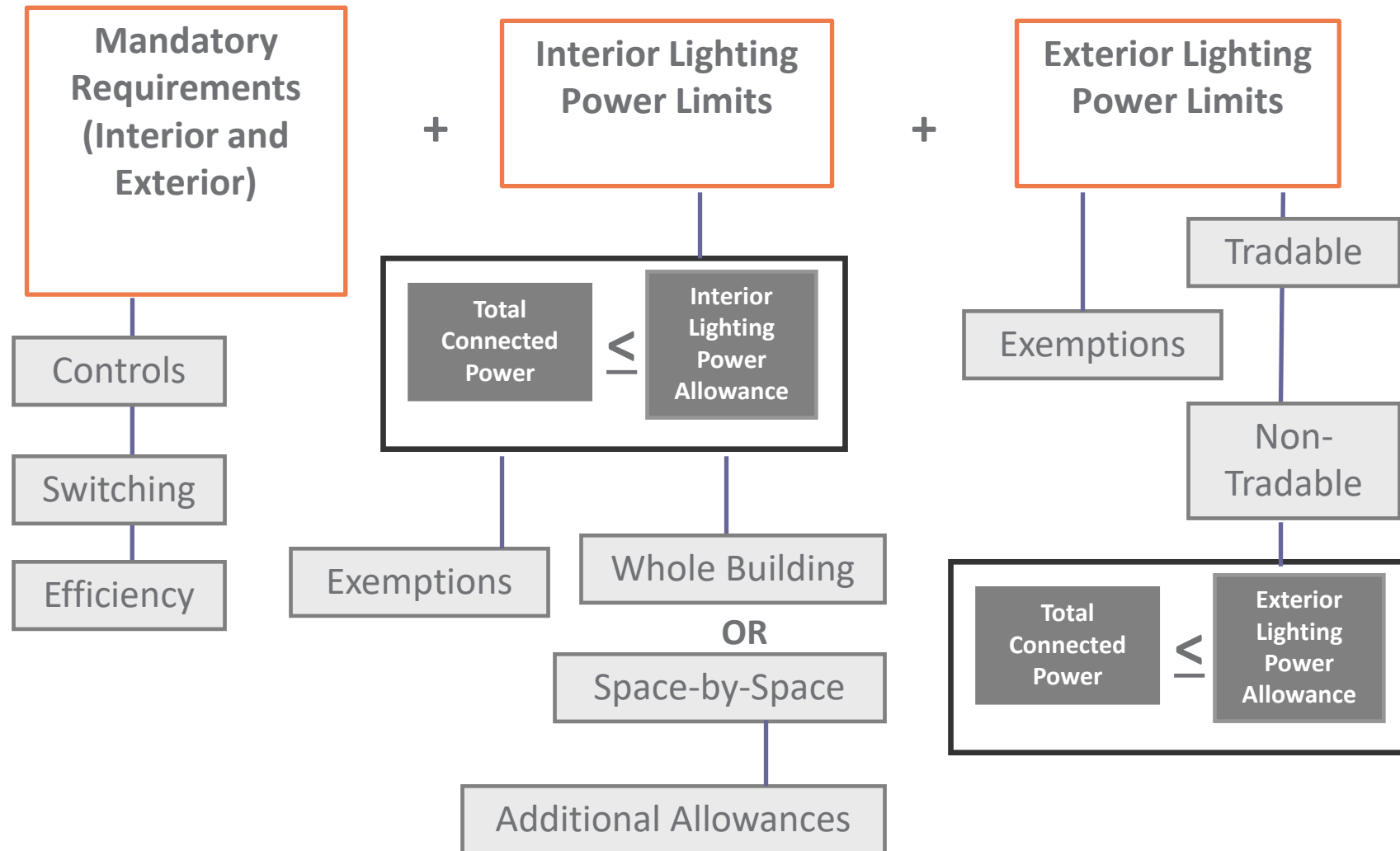
1-Exercise Center : Nonresidential

10000

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U- Factor _(a)
Roof: Metal Building, Standing Seam, Double Insulation Layer with Thermal Blocks (c), [Bldg. Use 1 - Exercise Center]	10000	30.0	0.0	0.072	0.031
Floor: Unheated Slab-On-Grade Fully insulated (uniform R-value across perimeter + under entire slab), [Bldg. Use 1 - Exercise Center] (b)	800	---	0.0	0.730	0.510
<u>NORTH</u> Ext. Wall: Steel-Framed, 16in. o.c., [Bldg. Use 1 - Exercise Center]	1000	15.0	0.0	0.118	0.049

Lighting Compliance

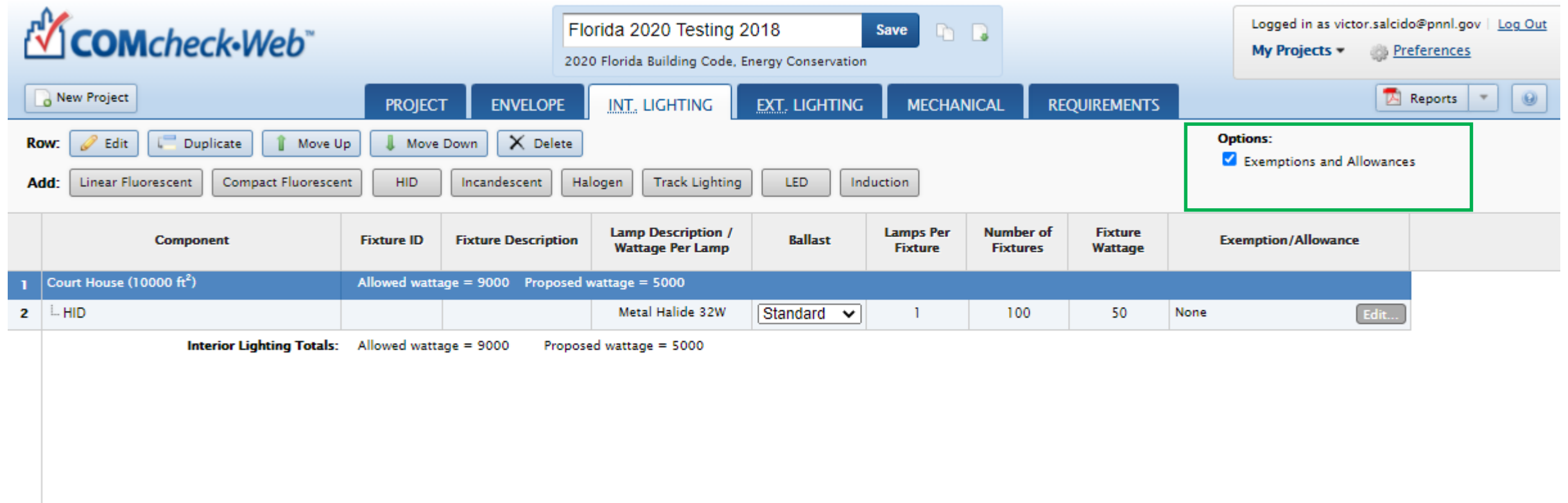


Lighting Fixture Categories

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

Lighting: Exemptions and Allowances

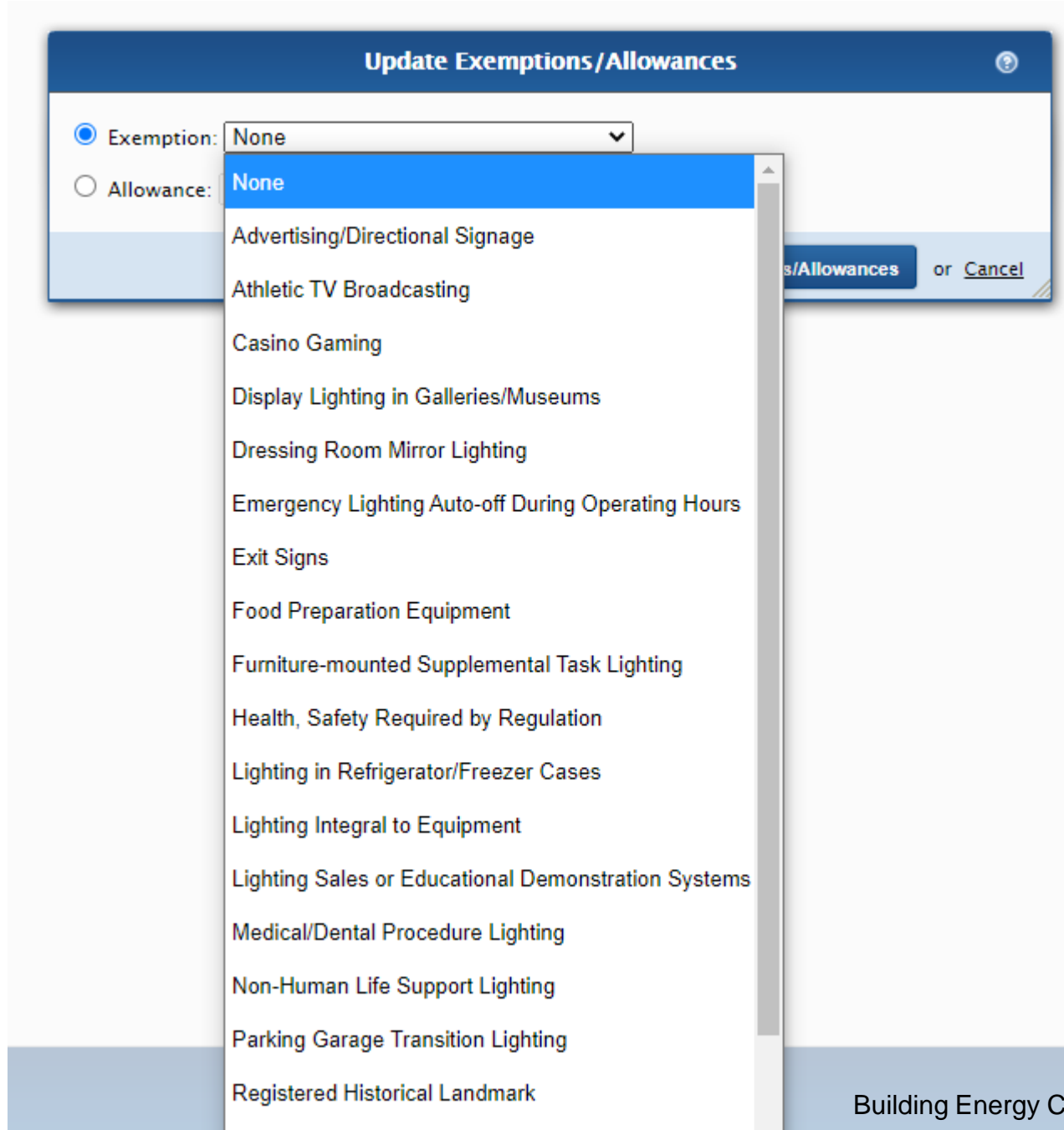
- ▶ Options checkbox – top right of screen
- ▶ Exemptions
 - Power for exempt fixtures is omitted from the **proposed wattage**
- ▶ Allowances
 - **Allowed wattage** for building increased by allowable amount



The screenshot shows the COMcheck-Web interface for a project named "Florida 2020 Testing 2018". The "INT. LIGHTING" tab is selected. In the top right corner, there is a user login for "victor.salcido@pnnl.gov" and a checked "Options: Exemptions and Allowances" checkbox. The main table displays lighting fixture data with columns for Component, Fixture ID, Fixture Description, Lamp Description / Wattage Per Lamp, Ballast, Lamps Per Fixture, Number of Fixtures, Fixture Wattage, and Exemption/Allowance. The table shows a total allowed wattage of 9000 and a proposed wattage of 5000. A specific fixture is listed as HID with a Metal Halide 32W lamp, Standard ballast, 1 lamp per fixture, 100 fixtures, 50 fixture wattage, and None exemption/allowance.

Component	Fixture ID	Fixture Description	Lamp Description / Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Exemption/Allowance
1 Court House (10000 ft ²)		Allowed wattage = 9000 Proposed wattage = 5000						
2 HID			Metal Halide 32W	Standard	1	100	50	None
Interior Lighting Totals:		Allowed wattage = 9000 Proposed wattage = 5000						

Lighting: Exemptions and Allowances (cont)



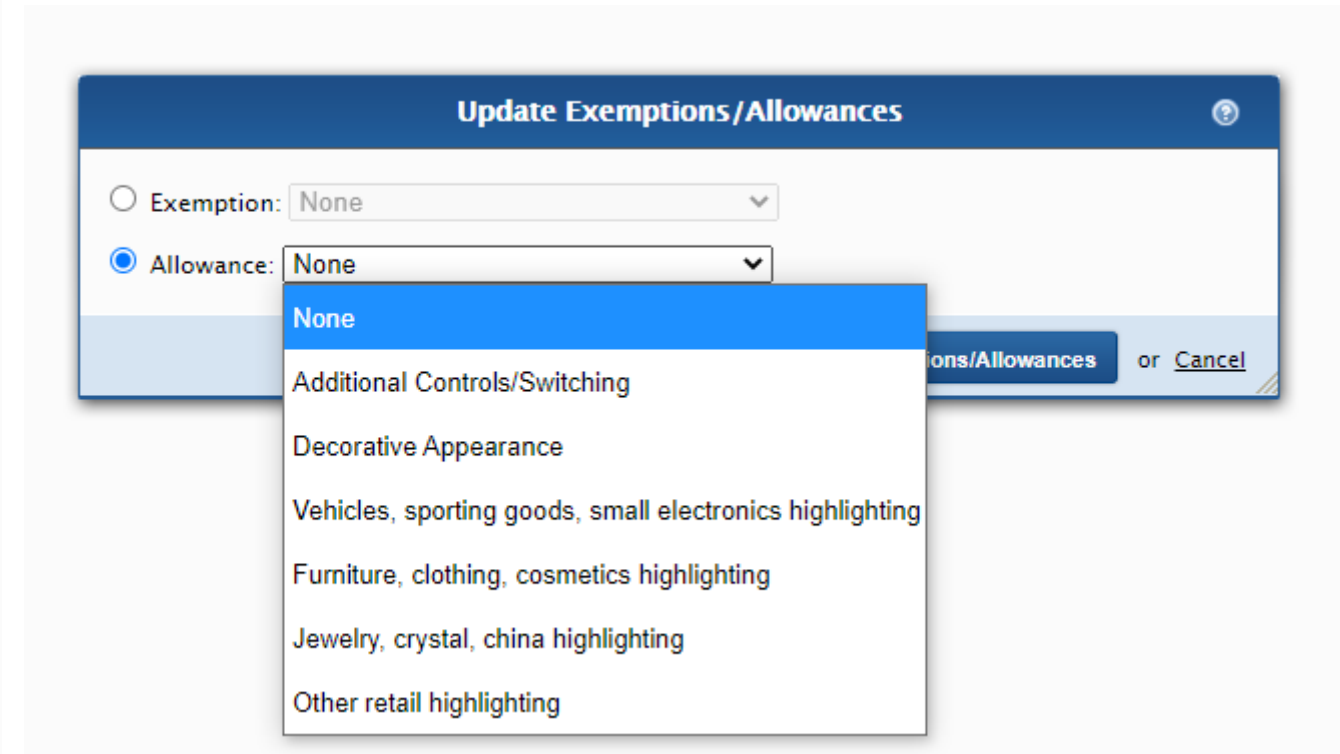
Update Exemptions/Allowances

Exemption: **None**

Allowance:

- None
- Advertising/Directional Signage
- Athletic TV Broadcasting
- Casino Gaming
- Display Lighting in Galleries/Museums
- Dressing Room Mirror Lighting
- Emergency Lighting Auto-off During Operating Hours
- Exit Signs
- Food Preparation Equipment
- Furniture-mounted Supplemental Task Lighting
- Health, Safety Required by Regulation
- Lighting in Refrigerator/Freezer Cases
- Lighting Integral to Equipment
- Lighting Sales or Educational Demonstration Systems
- Medical/Dental Procedure Lighting
- Non-Human Life Support Lighting
- Parking Garage Transition Lighting
- Registered Historical Landmark

Update Exemptions/Allowances or Cancel



Update Exemptions/Allowances

Exemption: **None**

Allowance: **None**

- None
- Additional Controls/Switching
- Decorative Appearance
- Vehicles, sporting goods, small electronics highlighting
- Furniture, clothing, cosmetics highlighting
- Jewelry, crystal, china highlighting
- Other retail highlighting

Update Exemptions/Allowances or Cancel

Exterior Lighting

- ▶ Inputs will be based on code selected
- ▶ Mandatory requirements
- ▶ Exemptions



≥



COMcheck-Web™

Florida 2020 Testing 2018 Save

2020 Florida Building Code, Energy Conservation

Logged in as victor.salcido@pnnl.gov | Log Out

My Projects Preferences

Reports

New Project PROJECT ENVELOPE INT. LIGHTING **EXT. LIGHTING** MECHANICAL REQUIREMENTS

Row: Edit Duplicate Move Up Move Down Delete

Add: Linear Fluorescent Compact Fluorescent HID Incandescent Halogen Track Lighting LED Induction

Options: Exemptions

	Component	Fixture ID	Fixture Description	Lamp Description / Wattage Per Lamp	Ballast	Lamps Per Fixture	Number of Fixtures	Fixture Wattage	Exemption
1	Illuminated area of facade wall or surface (2...			Non-tradable Wattage: Allowed wattage = 300 Proposed wattage = 300					
2	L-HID			Metal Halide 32W	Standard	1	10	30	None

Tradable Wattage Totals: Allowed wattage = 0 Proposed wattage = 0 Supplemental Wattage: 900W

Mechanical Systems



90.1 (2019) Standard

Row:

Add:

Component	Equipment Type	Quantity	Equipment Capacity	Fuel Type/Heat Source	Condenser Type	Fan System	System Details	Proposed Efficiency	Minimum Efficiency	Maximum Efficiency
-----------	----------------	----------	--------------------	-----------------------	----------------	------------	----------------	---------------------	--------------------	--------------------

[Use the mechanical equipment buttons above to list the mechanical systems in your building.](#)

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



Mechanical Systems

Create HVAC System

Heating Equipment

- None
- Central Furnace
- Duct Furnace
- Hydronic or Steam Coil
- Radiant Heater
- Unit Heater
- Other Heating Equipment

Cooling Equipment

- None
- Field-Assembled DX System
- Packaged Terminal DX Unit
- Single Package DX Unit
- Room Air Conditioner
- Single Package Vertical AC Unit
- Single Package Vertical AC Unit Nonweatherized Space Constrained Unit
- Split DX Unit
- VRF Air Conditioner
- VRF Zone Fan Unit
- Computer Room Air Conditioner
- DX-DOAS Unit
- DX-DOAS With Heat Recovery
- Hydronic Coil
- Passive Chilled Water Unit

» Create HVAC System or [Cancel](#)

Create Heat Pump

- Packaged Terminal Unit
- Single Packaged Unit
- Single Package Vertical Unit
- Single Package Vertical Heatpump Nonweatherized Space Constrained
- Split System
- Water Source Water-To-Water
- Groundwater Source Water-To-Water
- Ground Source, Brine-To-Water
- VRF Air Cooled Source Heat Recovery
- VRF Water Source Heat Recovery
- VRF Groundwater Source Heat Recovery
- VRF Ground Source Heat Recovery

» Create Heat Pump or [Cancel](#)

Mechanical Systems



2018 IECC Testing

Save

2018 IECC

Logged in as victor.salcido@pnnl.gov | [Log Out](#)

[My Projects](#) [Preferences](#)

Reports

New Project

PROJECT

ENVELOPE

INT. LIGHTING

EXT. LIGHTING

MECHANICAL

REQUIREMENTS

Row: [Edit](#) [Duplicate](#) [Move Up](#) [Move Down](#) [Delete](#)

Add: [HVAC System](#) [Heat Pump](#) [Plant](#) [Water Heating](#)

Proposed part load efficiency data may be required for HVAC or Plant cooling systems.

	Component	Equipment Type	Quantity	Equipment Capacity	Fuel Type/Heat Source	Condenser Type	Fan System	System Details	Proposed Part Load Eff.	Required Part Load Eff.	Proposed Full Load Eff.	Required Full Load Eff.
1	RTU-1	HVAC System	1				RTU-1	Single Zone Edit...				
2	Heating equipment	Central Furnace	1	89 kBtu/h	Electric				--	--	--	--
3	Cooling equipment	Single Package DX Unit	1	256 kBtu/h		Air Cooled		Air Economizer Edit...	0 IEER	11.6 IEER	12 EER	10 EER
4	RTU-2	HVAC System	1				RTU-2	Single Zone Edit...				
5	Heating equipment	Central Furnace	1	22 kBtu/h	Electric				--	--	--	--
6	Cooling equipment	Single Package DX Unit	1	54 kBtu/h		Air Cooled		Air Economizer Edit...	--	--	17.6 SEER	14 SEER
7	RTU-3	HVAC System	1				RTU-3	Single Zone Edit...				
8	Heating equipment	Central Furnace	1	89 kBtu/h	Electric				--	--	--	--
9	Cooling equipment	Single Package DX Unit	1	160 kBtu/h		Air Cooled		Air Economizer Edit...	0 IEER	12.4 IEER	12 EER	11 EER
10	Water Heater	Storage Water Heater	1	119 gallons	Electric			54 kW, Additional Equipm Edit...	--	--	0.15 SL, %/h...	0 SL, %/h (if ...

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

Update Fan System Details

Fan System ID: Area's Served:

Fan System Compliance Options

Motor Nameplate HP
 Flow control devices installed on exhaust/return to meet health, safety environmental air pressure requirements in hospital, vivarium or laboratory systems.

Brake HP (BHP)
 Pressure Drop Credits

	Fan ID	Fan Type	Fan Control	Design Air Volume (CFM)	BHP at System Design Conditions	Maximum BHP	Motor Nameplate HP	Max Motor Nameplate HP	Fan Energy Index (FEI)	FEI Exception
1	FAN 1	Supply	Constant	20000	20	20	30	30	78	Unspecified

Pressure Drop Credits

	Application	Credit
1	Particulate filtration credit: MERV 9 through	1.81554 <input type="button" value="Edit..."/>

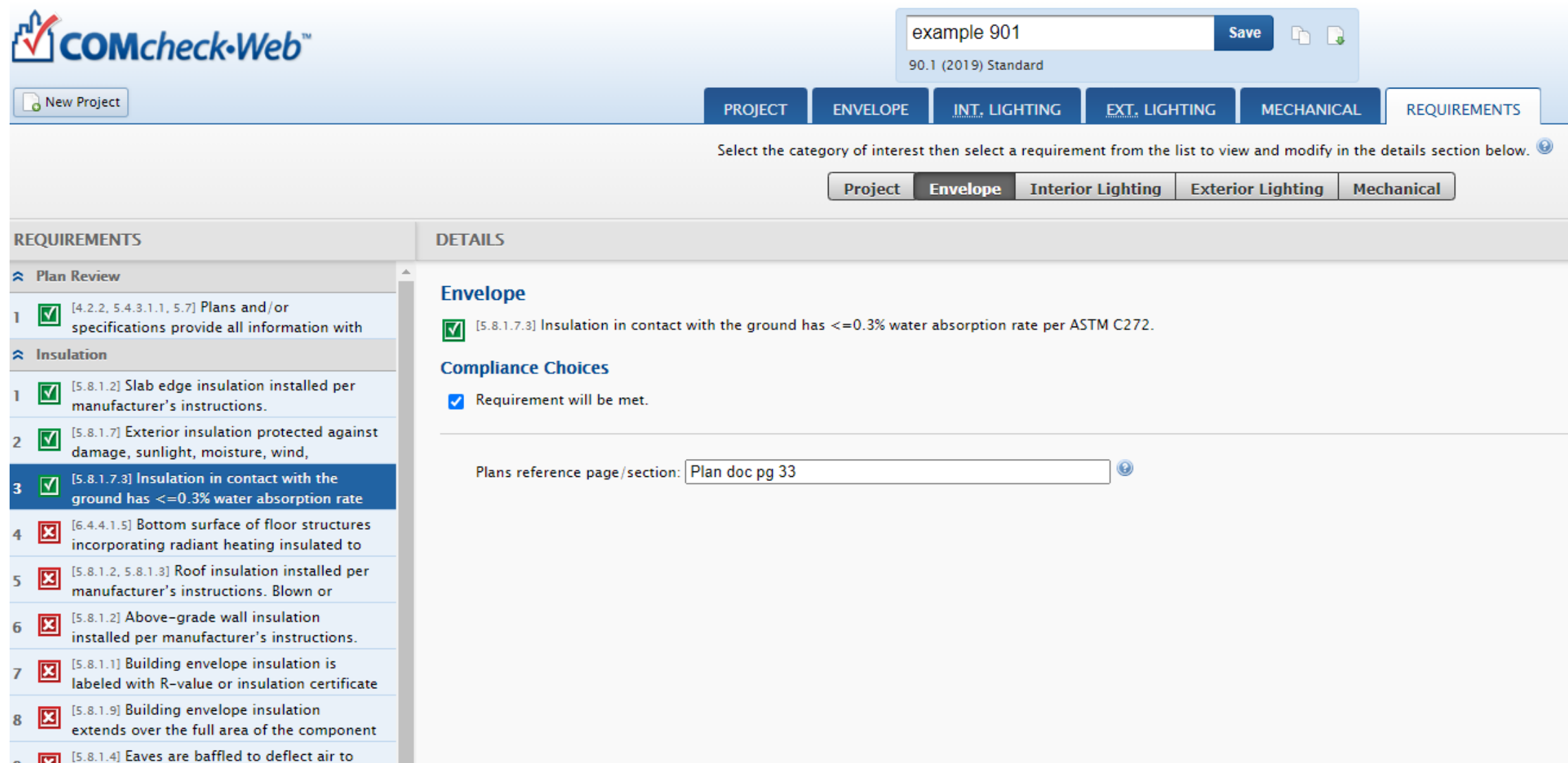
Compliance: Complies

Proposed: Maximum Allowed:

» Update Fan System Details or

Requirements Tab - Goals

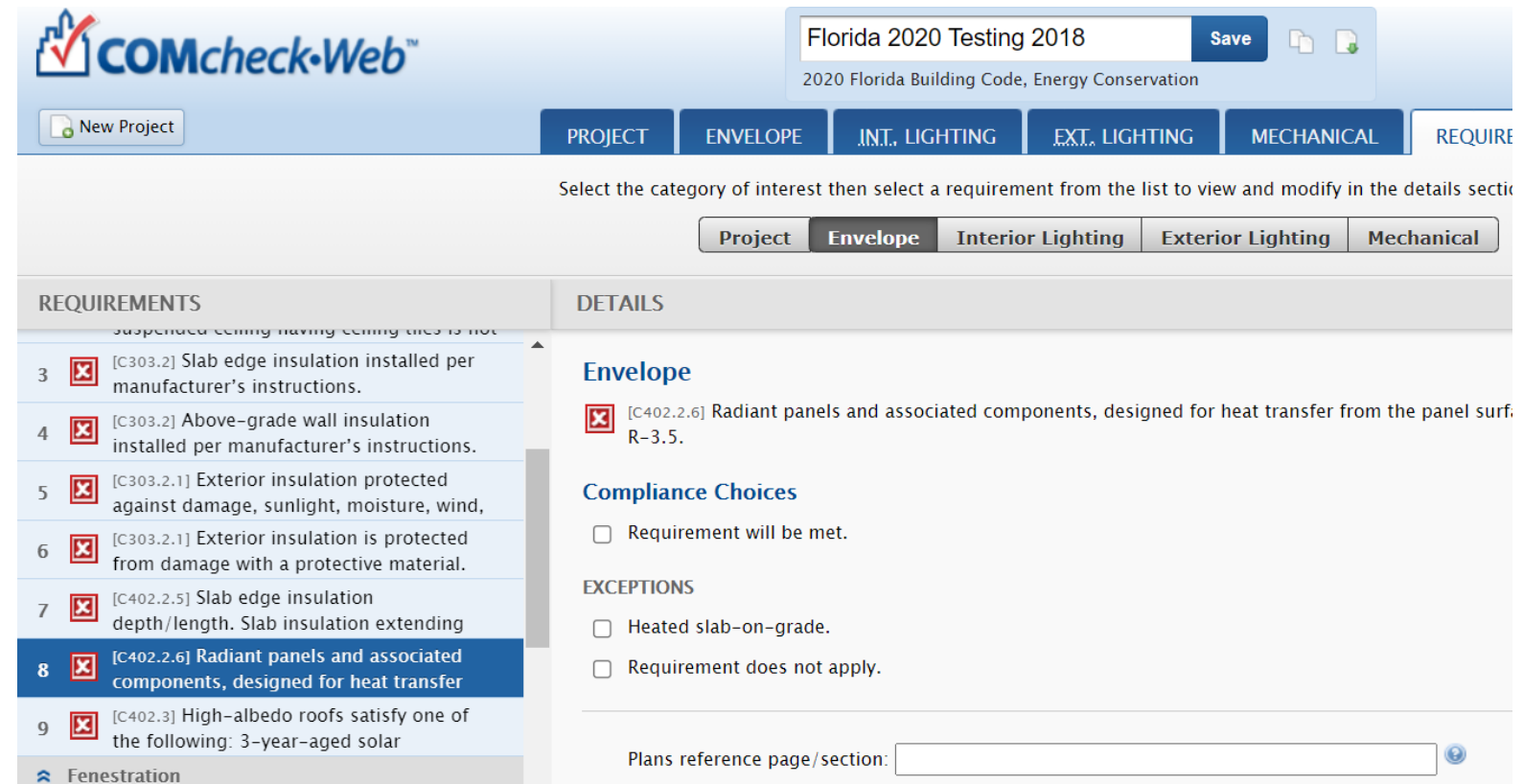
- Ensure user is aware of applicable mandatory requirements and addresses each in the software
- Provide better documentation for code officials



The screenshot shows the COMcheck-Web interface. At the top, there is a search bar containing 'example 901' and a 'Save' button. Below the search bar, there are navigation tabs for 'PROJECT', 'ENVELOPE', 'INT. LIGHTING', 'EXT. LIGHTING', 'MECHANICAL', and 'REQUIREMENTS'. The 'REQUIREMENTS' tab is selected. Below the tabs, there is a instruction: 'Select the category of interest then select a requirement from the list to view and modify in the details section below.' Below this instruction, there are sub-tabs for 'Project', 'Envelope', 'Interior Lighting', 'Exterior Lighting', and 'Mechanical'. The 'Envelope' sub-tab is selected. The main content area is divided into two sections: 'REQUIREMENTS' and 'DETAILS'. The 'REQUIREMENTS' section lists several requirements, with the third requirement, '[5.8.1.7.3] Insulation in contact with the ground has <=0.3% water absorption rate', highlighted in blue. The 'DETAILS' section shows the selected requirement, 'Envelope', with a green checkmark and the text '[5.8.1.7.3] Insulation in contact with the ground has <=0.3% water absorption rate per ASTM C272.' Below this, there is a 'Compliance Choices' section with a checked checkbox and the text 'Requirement will be met.' At the bottom of the details section, there is a text input field labeled 'Plans reference page/section:' containing the text 'Plan doc pg 33'.

Requirements Tab – How it Works

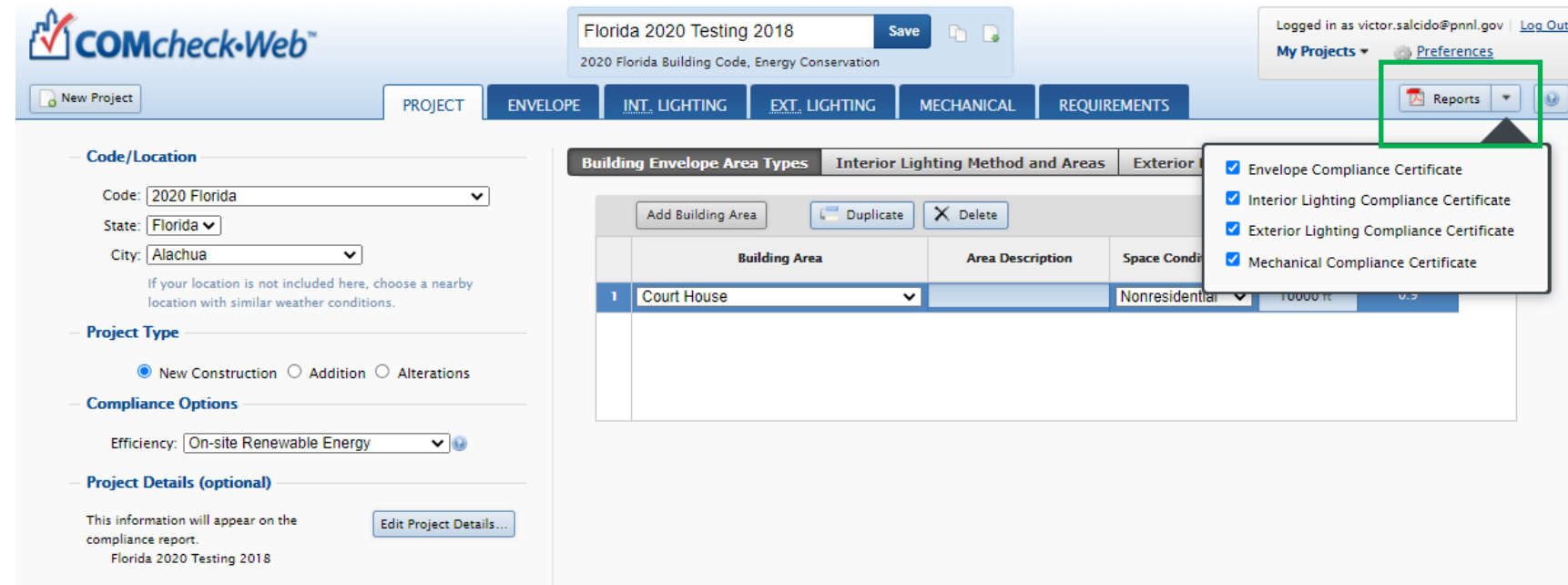
- For each requirement, the user
 - Chooses a “compliance option”
 - Requirement will be Met
 - Exempt or Exceptions
 - Requirement is Not Applicable or Requirement Does Not Apply
 - Notes how compliance for applicable requirements are documented
- This information is shown on the report in the “Comments/ Assumptions” column of the Inspection Checklist



The screenshot shows the COMcheck-Web interface. At the top, the project name is 'Florida 2020 Testing 2018' with a 'Save' button. Below the project name, the code '2020 Florida Building Code, Energy Conservation' is displayed. The interface has a navigation bar with tabs for PROJECT, ENVELOPE, INT. LIGHTING, EXT. LIGHTING, MECHANICAL, and REQUIREMENTS. The REQUIREMENTS tab is active. Below the navigation bar, there is a section to 'Select the category of interest then select a requirement from the list to view and modify in the details section'. This section has sub-tabs for Project, Envelope, Interior Lighting, Exterior Lighting, and Mechanical. The Envelope sub-tab is selected. Below this, there are two columns: REQUIREMENTS and DETAILS. The REQUIREMENTS column lists several items, with item 8, '[C402.2.6] Radiant panels and associated components, designed for heat transfer', highlighted in blue. The DETAILS column shows the selected requirement with a red 'X' icon, the text '[C402.2.6] Radiant panels and associated components, designed for heat transfer from the panel surface. R-3.5.', and a 'Compliance Choices' section with a checkbox for 'Requirement will be met.' and an 'EXCEPTIONS' section with checkboxes for 'Heated slab-on-grade.' and 'Requirement does not apply.' At the bottom, there is a field for 'Plans reference page/section:'.

Reports

- Click on Reports – top right of screen
- 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



The screenshot shows the COMcheck-Web interface for a project titled "Florida 2020 Testing 2018". The user is logged in as victor.salcido@pnnl.gov. The interface includes a navigation menu with options: PROJECT, ENVELOPE, INT. LIGHTING, EXT. LIGHTING, MECHANICAL, and REQUIREMENTS. A "Reports" dropdown menu is open, showing the following options:

- Envelope Compliance Certificate
- Interior Lighting Compliance Certificate
- Exterior Lighting Compliance Certificate
- Mechanical Compliance Certificate

The main content area shows project details for "2020 Florida" in "Florida" at "Alachua". The project type is "New Construction". The compliance options include "On-site Renewable Energy". The project details section shows "This information will appear on the compliance report. Florida 2020 Testing 2018".

Building Area	Area Description	Space Condition
1 Court House		Nonresidential

Reports – Compliance Certificate



COMcheck Software

Envelope Compliance Certificate

Project Information

Energy Code: 90.1 (2013) Standard
 Project Title: Project Demo
 Location: Bozeman, Montana
 Climate Zone: 6b (weather data: TBD)
 Project Type: New Construction
 Vertical Glazing / Wall Area: 33%
 Permit Date: 998877
 Permit No. XYZ
 Performance Sim. Specs: EnergyPlus Version 8.1.0.009

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-Admin offices (Office) : Nonresidential	2000
2-Lumber storage (Warehouse) : Semiheated	100000

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U- Factor _{min}
Roof: Insulation Entirely Above Deck, [Bldg. Use 1 - Admin offices]	10000	---	30.0	0.032	0.032
Slab floor: Slab-On-Grade:Unheated, Vertical 2 ft., [Bldg. Use 1 - Admin offices] (c)	400	---	20.0	0.510	0.510
<u>NORTH</u>					
Exterior Wall 1: Wood-Framed, 24" o .c., [Bldg. Use 1 - Admin offices]	1500	19.0	5.0	0.047	0.051
Window 1: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Admin offices] (b)	500	---	---	0.420	0.420
<u>EAST</u>					
Exterior Wall 2: Wood-Framed, 24" o .c., [Bldg. Use 1 - Admin offices]	1500	19.0	5.0	0.047	0.051
Window 2 in Wall2: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Admin offices] (b)	500	---	---	0.420	0.420
<u>SOUTH</u>					
Exterior Wall 4: Wood-Framed, 24" o .c., [Bldg. Use 1 - Admin offices]	1500	19.0	5.0	0.047	0.051
Window 4 in wall 4: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Admin offices] (b)	500	---	---	0.420	0.420
<u>WEST</u>					
Exterior Wall 3: Wood-Framed, 24" o .c., [Bldg. Use 1 - Admin offices]	1500	19.0	5.0	0.047	0.051
Window 3 in wall 3: Metal Frame:Fixed, Perf. Specs.: Product ID	500	---	---	0.420	0.420

Reports – Compliance Certificate (cont)



COMcheck Software
Envelope Compliance Certificate

Project Information

Energy Code: 90.1 (2013) Standard
 Project Title: Project Demo
 Location: Bozeman, Montana
 Climate Zone: 6b (weather data: TBD)
 Project Type: New Construction
 Vertical Glazing / Wall Area: 33%
 Permit Date: 998877
 Permit No. XYZ
 Performance Sim. Specs: EnergyPlus Version 8.1.0.009

Construction Site:
123 Main St.
Mainville, MT 59515

Owner/Agent:
John Doe
Acme Real Estatel 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-Admin offices (Office) : Nonresidential	2000
2-Lumber storage (Warehouse) : Semiheated	100000

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
Roof: Insulation Entirely Above Deck, [Bldg. Use 1 - Admin offices]	10000	---	30.0	0.032	0.032
Slab floor: Slab-On-Grade:Unheated, Vertical 2 ft., [Bldg. Use 1 - Admin offices] (c)	400	---	20.0	0.510	0.510
NORTH					
Exterior Wall 1: Wood-Framed, 24" o.c., [Bldg. Use 1 - Admin offices]	1500	19.0	5.0	0.047	0.051
Window 1: Metal Frame:Fixed, Perf. Specs.: Product ID AX321, SHGC 0.40, VT 0.44, [Bldg. Use 1 - Admin offices] (b)	500	---	---	0.420	0.420

Verify energy code, location, and construction type specifications

Reports – Compliance Certificate (cont)

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
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	
<u>NORTH</u>					
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	
<u>EAST</u>					
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

Inspection Checklist

Energy Code: 90.1 (2013) Standard

Requirements: 25.0% 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.

90.1 (2010) Standard	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
8.4.2 [EL10] ²	At least 50% of all 125 volt 15- and 20-Amp receptacles are controlled by an automatic control device.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
9.4.1.1 [EL1] ²	Automatic controls to shut off all building lighting.	<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: Spec G, page 3, section 32
9.4.1.2 [EL2] ²	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	<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: Spec G, page 3, section 32
9.4.1.3 [EL11] ²	Parking garage lighting is equipped with required lighting controls and daylight transition zone lighting.	<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: Spec G, page 3, section 32
9.4.1.4 [EL12] ¹	Primary sidelighted areas \geq 250 ft ² are equipped with required lighting.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: Florida 2020 Testing 2018

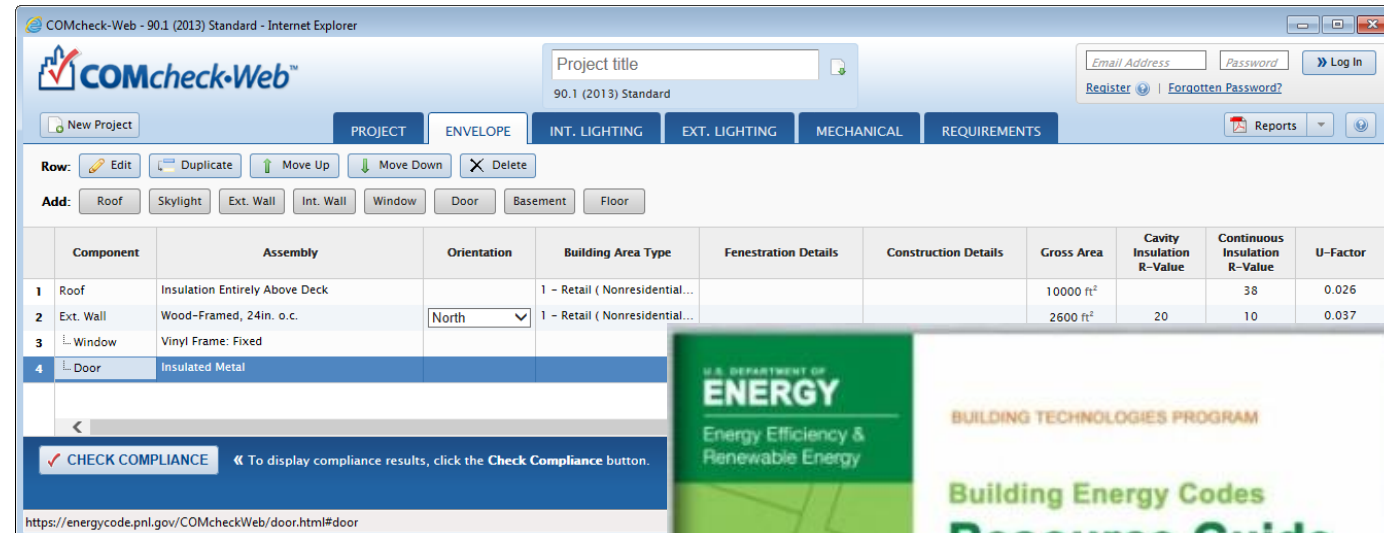
Report date: 07/20/21

Data filename:

Page 3 of 8

U.S. DOE: BECP Resources

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



COMcheck-Web - 90.1 (2013) Standard - Internet Explorer

Project title: 90.1 (2013) Standard

Buttons: New Project, PROJECT, ENVELOPE, INT. LIGHTING, EXT. LIGHTING, MECHANICAL, REQUIREMENTS, Reports

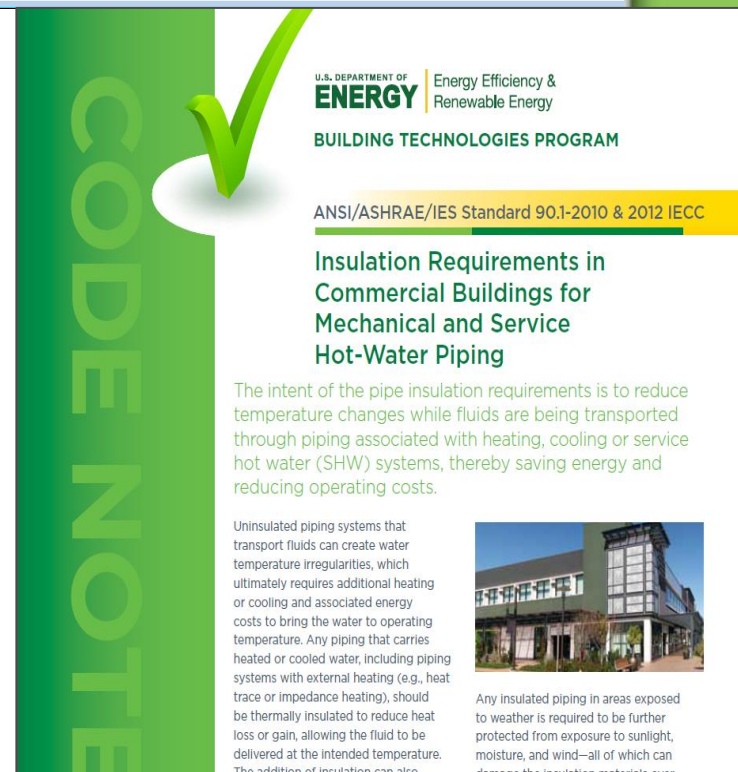
Row: Edit, Duplicate, Move Up, Move Down, Delete

Add: Roof, Skylight, Ext. Wall, Int. Wall, Window, Door, Basement, Floor

Component	Assembly	Orientation	Building Area Type	Fenestration Details	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor
1 Roof	Insulation Entirely Above Deck		1 - Retail (Nonresidential...			10000 ft ²		38	0.026
2 Ext. Wall	Wood-Framed, 24in. o.c.	North	1 - Retail (Nonresidential...			2600 ft ²	20	10	0.037
3 Window	Vinyl Frame: Fixed								
4 Door	Insulated Metal								

CHECK COMPLIANCE To display compliance results, click the Check Compliance button.

<https://energycodes.pnl.gov/COMcheckWeb/door.html#door>

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy
BUILDING TECHNOLOGIES PROGRAM

ANSI/ASHRAE/IES Standard 90.1-2010 & 2012 IECC

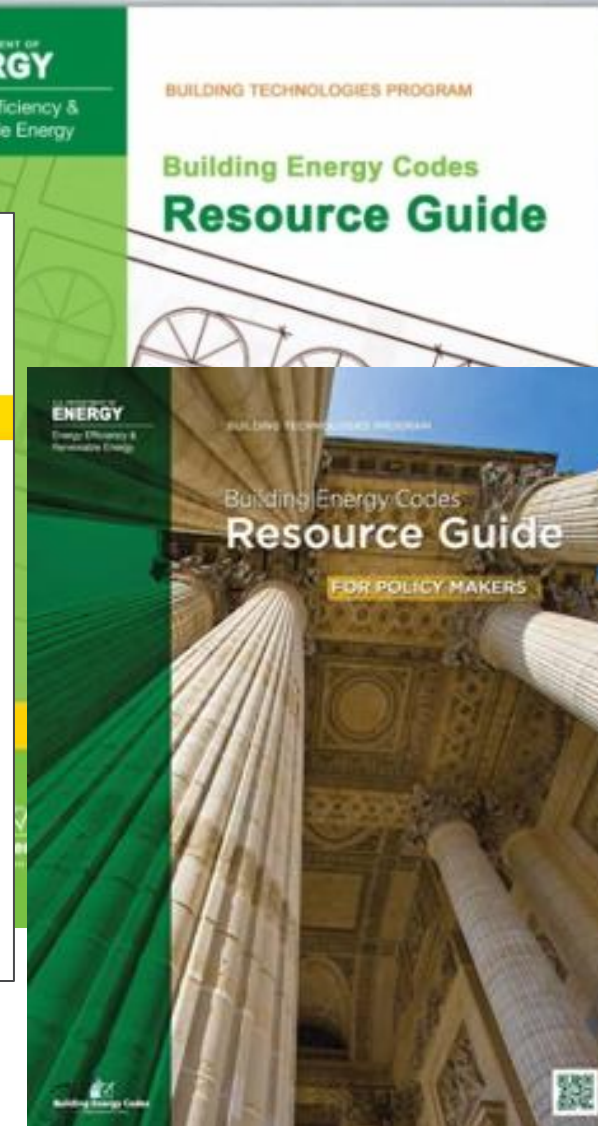
Insulation Requirements in Commercial Buildings for Mechanical and Service Hot-Water Piping

The intent of the pipe insulation requirements is to reduce temperature changes while fluids are being transported through piping associated with heating, cooling or service hot water (SHW) systems, thereby saving energy and reducing operating costs.

Uninsulated piping systems that transport fluids can create water temperature irregularities, which ultimately requires additional heating or cooling and associated energy costs to bring the water to operating temperature. Any piping that carries heated or cooled water, including piping systems with external heating (e.g., heat trace or impedance heating), should be thermally insulated to reduce heat loss or gain, allowing the fluid to be delivered at the intended temperature. The addition of insulation can also...

Any insulated piping in areas exposed to weather is required to be further protected from exposure to sunlight, moisture, and wind—all of which can damage the insulation materials over...

Building Energy Codes Program




COMcheck – Next Generation (Anticipated Fall 2021)



FUTURE PROOFING OUR NEXT GENERATION



COMcheck – Project Page



Help Center

JOHN.SMITH@GMAIL.COM

COLLAPSE

↑ MY PROJECTS

NEW PROJECT
IMPORT PROJECT
CREATE SAMPLE PROJECT

<input type="checkbox"/> Project ↑	Last Updated	Energy Code	Status	Sharing
<input type="checkbox"/> BOBBYS TOWING	Sat Feb 01 2020	Utah 2020	Draft	
<input type="checkbox"/> BUFFALO HOSPITAL	Sat Dec 05 2020	Vermont 2020	Submitted	
<input type="checkbox"/> CAPONES HIDEOUT	Mon Apr 23 2018	2018 IECC	Draft	
<input type="checkbox"/> DUGALL'S` STRIP MALL	Thu Mar 07 2019	Florida 2017	Submitted	
<input type="checkbox"/> HILLSIDE LIBRARY	Sun Jan 05 2020	2015 IECC	Submitted	

No Projects Selected.
Delete
 Dense layout


Rows per page: 5 ▾ 1-5 of 13 < >

↓

SHARED PROJECT REQUESTS

4 Items

COMcheck – Project Page



- Help Center
- Return to Projects
- TESTUSER
- ENVELOPE
- INTERIOR LIGHTING
- EXTERIOR LIGHTING
- MECHANICAL
- REQUIREMENTS
- AUDIT
- CHECK COMPLIANCE
- REPORTS
- COLLAPSE

▼ Bob's test 1

SAVE

Date: 2022-5-30
Created By:
Sharing:
Status:

Click here to continue [HERE](#)

Project Title

Bob's test 1

Location (Climate Zone 6)

Bozeman, Montana (59715)

Energy Code

90.1 (2019) Standard

Project Type

Alteration

Air Barrier

Unspecified

> Building Areas

Court House Bob's courthouse name /Court House Bob's courthouse name

NONE


Area: 10000

Notes: undefined

ADD BUILDING AREA

> Project Details (optional)

COMcheck Upgrade – Envelope

 **COMcheck-Web™**

Help Center

Return to Projects

TESTUSER

ENVELOPE

INTERIOR LIGHTING

EXTERIOR LIGHTING

MECHANICAL

REQUIREMENTS

AUDIT

CHECK COMPLIANCE

REPORTS

COLLAPSE

Bob's test 1 90.1 (2019) Standard • Bozeman, Montana (59715) • Climate Zone 6 Alteration



ENVELOPE ADD BUILDING AREA **SAVE**

▼ Court House Bob's courthouse name Court House Bob's courthouse name AREA ACTIONS

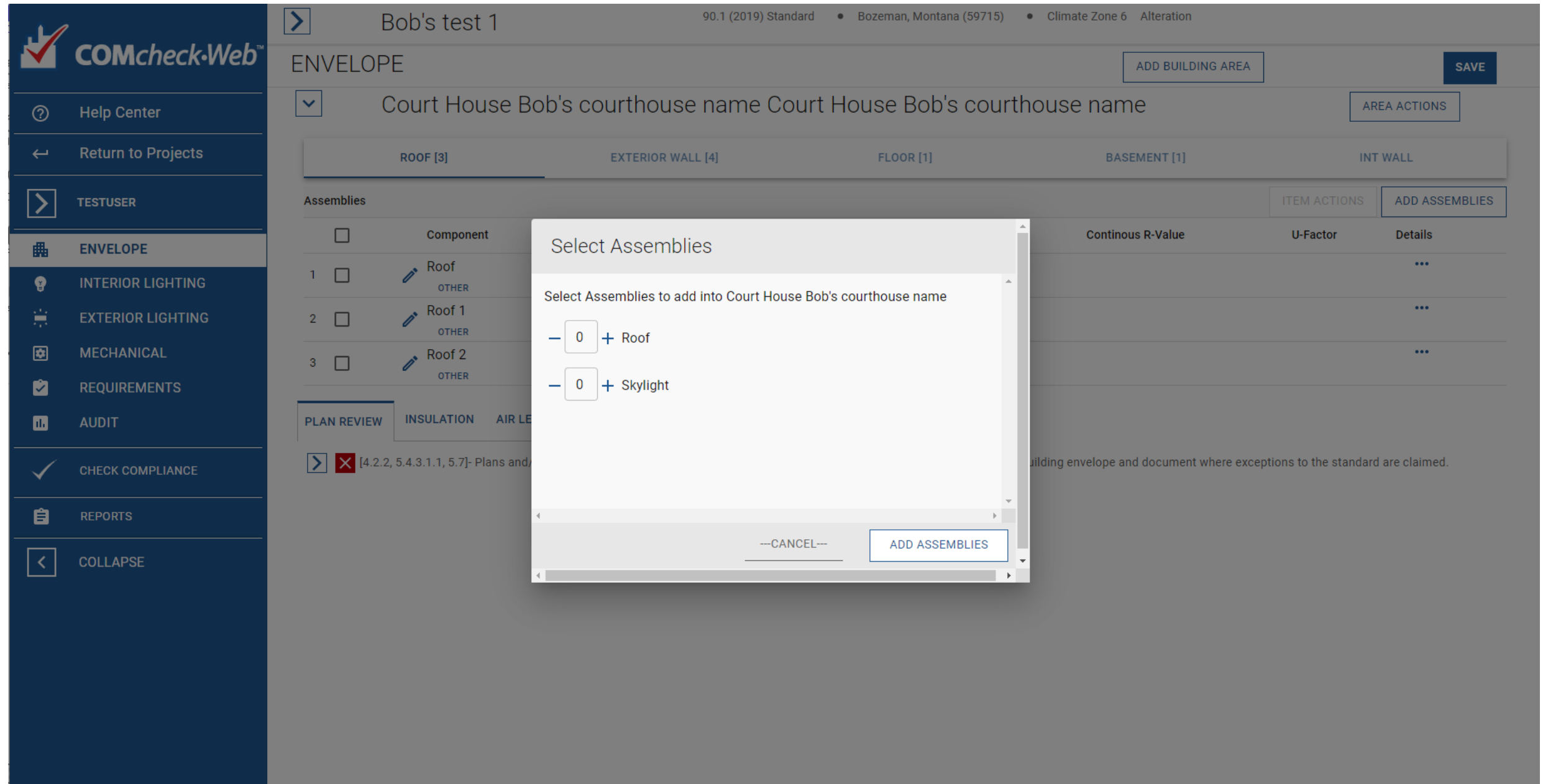
ROOF [3] EXTERIOR WALL [4] FLOOR [1] BASEMENT [1] INT WALL

Assemblies						ITEM ACTIONS	ADD ASSEMBLIES
	<input type="checkbox"/>	Component	Gross Area	Cavity R-Value	Continuous R-Value	U-Factor	Details
1	<input type="checkbox"/>	 Roof <small>OTHER</small>	0				...
2	<input type="checkbox"/>	 Roof 1 <small>OTHER</small>	0				...
3	<input type="checkbox"/>	 Roof 2 <small>OTHER</small>	0				...

PLAN REVIEW INSULATION AIR LEAKAGE FENESTRATION

  [4.2.2, 5.4.3.1.1, 5.7]- 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.

COMcheck Upgrade – Envelope



The screenshot shows the COMcheck-Web interface for a project named "Bob's test 1". The main section is titled "ENVELOPE" and displays a table of building components. A dialog box titled "Select Assemblies" is open, allowing the user to select assemblies to add to the project. The dialog box contains the following text:

Select Assemblies to add into Court House Bob's courthouse name

- 0 + Roof
- 0 + Skylight

The dialog box also includes a "CANCEL" button and an "ADD ASSEMBLIES" button. The background interface shows a sidebar with navigation options like "Help Center", "Return to Projects", "TESTUSER", "ENVELOPE", "INTERIOR LIGHTING", "EXTERIOR LIGHTING", "MECHANICAL", "REQUIREMENTS", "AUDIT", "CHECK COMPLIANCE", "REPORTS", and "COLLAPSE". The main content area shows a table with columns for "Component", "Continuous R-Value", "U-Factor", and "Details". The "Component" column lists "Roof", "Roof 1", and "Roof 2". The "Continuous R-Value" column is currently empty. The "U-Factor" column is also empty. The "Details" column contains three rows of ellipses (...).

COMcheck Upgrade – Envelope

COMcheck-Web

Return to Projects

dan.johnson@email.com

ENVELOPE

INT. LIGHTING

EXT. LIGHTING

MECHANICAL

REQUIREMENTS

CHECK COMPLIANCE

New Project
2020 IECC • Bellevue, WA • New Construction • UA Trade off

ENVELOPE ADD BUILDING AREA SAVE

COURT HOUSE of Edenborough AREA ACTIONS ITEM ACTIONS ADD ASSEMBLY

Component	Assembly	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor
<input type="checkbox"/> Floor	Select Assembly	0	0	0	0
<input checked="" type="checkbox"/> Wall - 1	Select Assembly	0	0	0	0
<input type="checkbox"/> Window - 1 UA: 0 SHGC: 0 Projection Factor: 0	Select Assembly				0
<input type="checkbox"/> Window - 2 UA: 0 SHGC: 0 Projection Factor: 0	Select Assembly				0
<input type="checkbox"/> Window - 3 UA: 0 SHGC: 0 Projection Factor: 0	Select Assembly				0
<input type="checkbox"/> Window - 4 UA: 0 SHGC: 0 Projection Factor: 0	Select Assembly				0
<input checked="" type="checkbox"/> Wall - 2	Select Assembly	0	0	0	0
<input checked="" type="checkbox"/> Wall - 3	Select Assembly	0	0	0	0
<input checked="" type="checkbox"/> Wall - 4	Select Assembly	0	0	0	0
<input type="checkbox"/> Roof	Select Assembly	2,000	1	1	0.219
<input type="checkbox"/> Skylight - 1 Construction Details: Select Assembly Fenestration Details: Code default UA: 0 SHGC: 0.8	Select Assembly				0

PARKING GARAGE North facing
Empty

REQUIREMENTS

Plan Review

Insulation

Fenestration

Air Leakage

Plan Review

[C406] - {Requirement Name}

Details

Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.

Compliance Choices

Requirements will be met

Not applicable

Exceptions

Requirements does not apply

[C408.1.1] - {Requirement Name}

Details

Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.

Compliance Choices

Requirements will be met

Not applicable

COMcheck Upgrade – Batch Operations

Batch Edit Assemblies

Components to edit:

Wall 1 Wood-Framed, 16in. o.c.
 Wall 2 Wood-Framed, 16in. o.c.
 Wall 3 Wood-Framed, 16in. o.c.
 Wall 4 Wood-Framed, 16in. o.c.

Component	Thickness	Configuration
<input checked="" type="radio"/> Wood-Framed, 16in. o.c.		
<input type="radio"/> Wood-Framed, 24in. o.c.		
<input type="radio"/> Steel-Framed, 16in. o.c.		
<input type="radio"/> Steel-Framed, 24in. o.c.		
<input type="radio"/> Metal Building Wall		
<input type="radio"/> Solid Concrete Wall	3" ▼	
<input type="radio"/> Concrete Block	6" ▼	Solid Grouted ▼
<input type="radio"/> Other (U-Factor option)		Wood Framed Wall ▼

<input checked="" type="checkbox"/> Gross Area	<input type="text" value="0.15"/>
<input checked="" type="checkbox"/> Cavity Insulation R-Value	<input type="text" value="0"/>
<input checked="" type="checkbox"/> Continuous Insulation R-Value	<input type="text" value="0"/>
<input checked="" type="checkbox"/> U Factor	<input type="text" value="0"/>

–CANCEL– APPLY CHANGES

COMcheck Upgrade – Interior Lighting

COMcheck-Web™

- Help Center
- Return to Projects
- TESTUSER
- ENVELOPE
- INTERIOR LIGHTING**
- EXTERIOR LIGHTING
- MECHANICAL
- REQUIREMENTS
- AUDIT
- CHECK COMPLIANCE
- REPORTS
- COLLAPSE

Bob's test 1 90.1 (2019) Standard • Bozeman, Montana (59715) • Climate Zone 6 Alteration

INTERIOR LIGHTING ADD BUILDING AREA **SAVE**

▼ Court House Bob's courthouse name Court House Bob's courthouse name AREA ACTIONS

Area: 10000 W/ft²: 0.79 Target Wattage: 7900.00 Proposed Wattage: 100.00

SPACES/FIXTURES **CONTROLS**

Lighting Spaces ITEM ACTIONS **ADD SPACES**

	Space Name	Area	Power Density	Proposed Wattage	Total Watts	Target Wattage
1	Space	20000	0.63	100.00		12200.00
1	↳ LED Fixture				10	

PLAN REVIEW CONTROLS WATTAGE POST CONSTRUCTION

✖ [4.2.2, 9.4.3, 9.7]- Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.

COMcheck Upgrade – Exterior Lighting

COMcheck-Web™

- Help Center
- Return to Projects
- TESTUSER
- ENVELOPE
- INTERIOR LIGHTING
- EXTERIOR LIGHTING**
- MECHANICAL
- REQUIREMENTS
- AUDIT
- CHECK COMPLIANCE
- REPORTS
- COLLAPSE



Bob's test 1

90.1 (2019) Standard • Bozeman, Montana (59715) • Climate Zone 6 Alteration

EXTERIOR LIGHTING

EDIT BUILDING EXTERIORS

SAVE

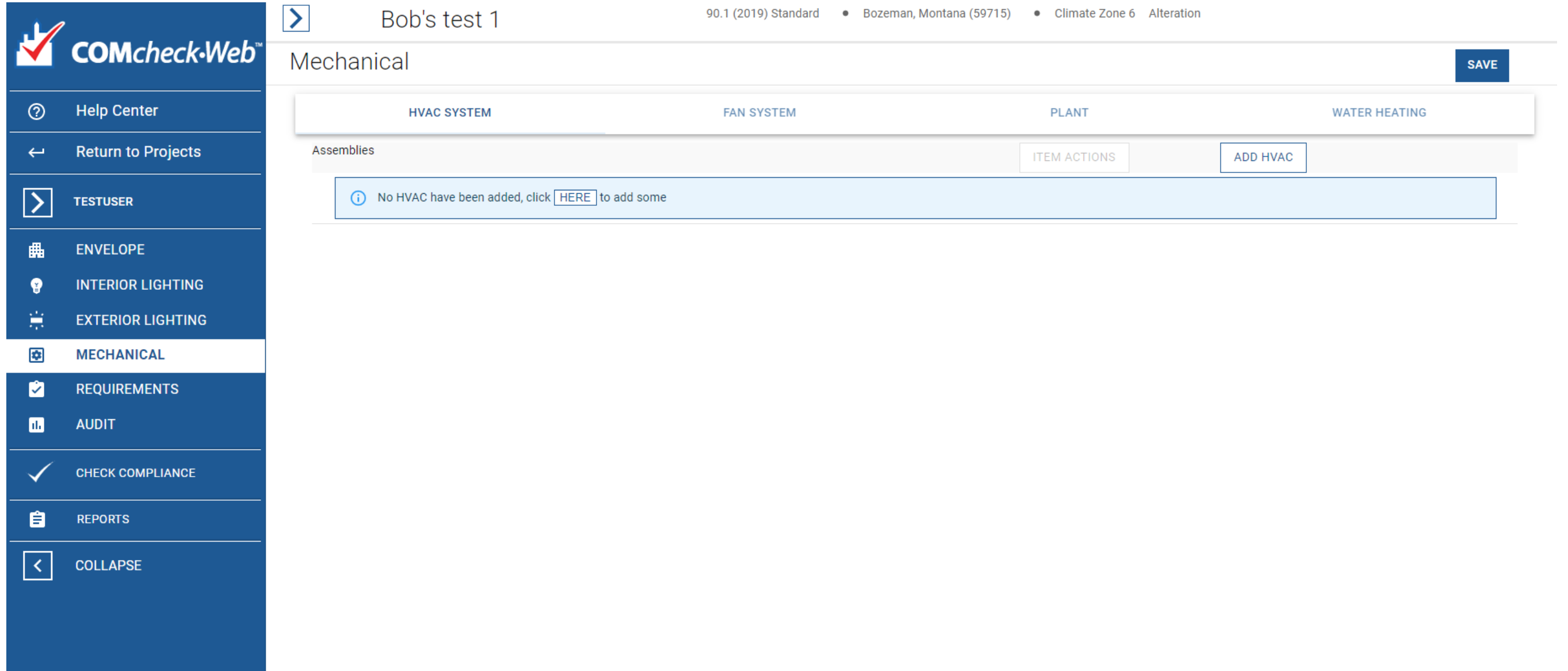
Zone: Light industrial are... ▾

FIXTURES		CONTROLS	
Building exteriors			
			ITEM ACTIONS
			ADD BUILDING EXTERIORS
	Type	Target Wattage	Proposed Wattage
1	<input type="checkbox"/> Landscaping Area	80	200
1	<input checked="" type="checkbox"/> Landscape LED		
TOTALS:		80	200

PLAN REVIEW | **CONTROLS** | WATTAGE

[9.7]- Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.

COMcheck Upgrade – Mechanical



The screenshot shows the COMcheck-Web interface. On the left is a dark blue navigation sidebar with the following items: Help Center, Return to Projects, TESTUSER, ENVELOPE, INTERIOR LIGHTING, EXTERIOR LIGHTING, MECHANICAL (highlighted), REQUIREMENTS, AUDIT, CHECK COMPLIANCE, REPORTS, and COLLAPSE. The main content area is titled 'Bob's test 1' and includes the following information: 90.1 (2019) Standard, Bozeman, Montana (59715), Climate Zone 6, and Alteration. Below this is a 'Mechanical' section with a 'SAVE' button. A tabbed interface shows 'HVAC SYSTEM' selected, with other tabs for 'FAN SYSTEM', 'PLANT', and 'WATER HEATING'. Under the 'HVAC SYSTEM' tab, there is an 'Assemblies' section with an 'ITEM ACTIONS' button and an 'ADD HVAC' button. A light blue message box states: 'No HVAC have been added, click [HERE](#) to add some'.

COMcheck Upgrade – Mechanical

Add HVAC

1 Heating Equipment 2 Cooling Equipment 3 System Details 4 Zoning 5 Configure Economizer

Configure Heating Equipment

None
 Central Furnace
 Duct Furnace
 Hydronic or Steam Coil
 Radiant Heater
 Unit Heater
 Other Heating Equipment

-CANCEL- NEXT

Add HVAC

1 Heating Equipment 2 Cooling Equipment 3 System Details 4 Zoning 5 Configure Economizer

Configure Cooling Equipment

None
 Field-Assembled DX System
 Packaged Terminal DX Unit
 Single Package DX Unit
 Split DX Unit
 VRF Zone Fan Unit
 Hydronic Coil
 Passive Chilled Water Unit

-CANCEL- NEXT

Add HVAC

1 Heating Equipment 2 Cooling Equipment 3 System Details 4 Zoning 5 Configure Economizer

Heating Equipment

Quantity:

Capacity:

Fuel Type / Heat Source: Unspecified ▾

Cooling Equipment

Quantity:

Capacity:

Condenser Type: Unspecified ▾

-CANCEL- NEXT

Add HVAC

1 Heating Equipment 2 Cooling Equipment 3 System Details 4 Zoning 5 Configure Economizer

Configure Zoning Equipment

Single Zone Perimeter System
 Multiple Zone

Multiple Zone Details

Distribution Type: Single Duct ▾

Terminal Unit Type:

VAX Box CV Mixing Box
 Fan Powered VAX Box Reheat/Recool Coil
 VAV Mixing Box

Reheat Type:

Electricity
 Hydronic
 Steam

-CANCEL- NEXT

Add HVAC

1 Heating Equipment 2 Cooling Equipment 3 System Details 4 Zoning 5 Configure Economizer

Configure Zoning Equipment

Economizer Type: Air ▾ Economizer Exception: None ▾

-CANCEL- ADD HVAC SYSTEM

COMcheck Upgrade – Mechanical

COMcheck-Web

Return to Projects

Help Center

dan.johnson@email.com

ENVELOPE

INT. LIGHTING

EXT. LIGHTING

MECHANICAL

REQUIREMENTS

CHECK COMPLIANCE

NEW PROJECT 2020 IECC - Bellevue, WA - New Construction - UA Trade off

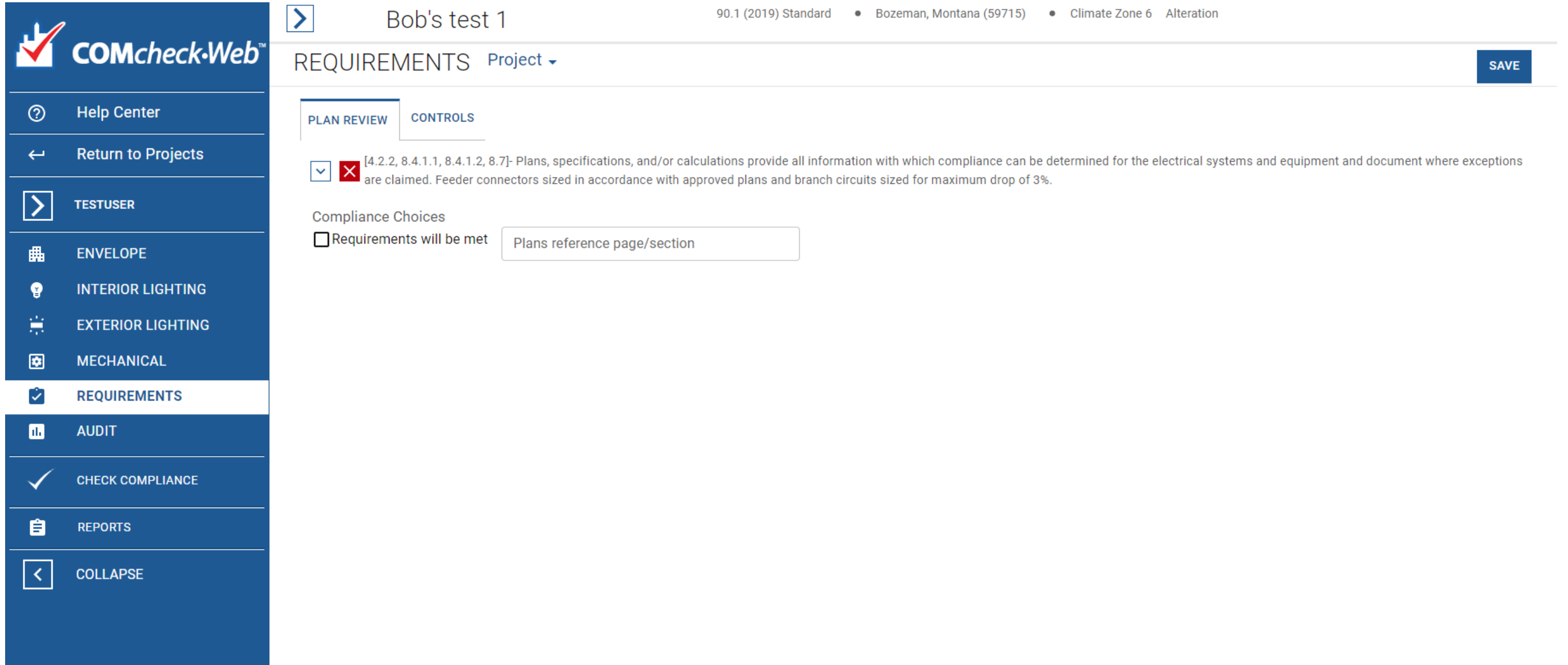
MECHANICAL SAVE

HVAC System Heat Pump Plant Water Heating

Primary Assemblies ITEM ACTIONS ADD ASSEMBLY


Component	Qty	Eqmt Cap	System Type	Prop. Eff	Min. Eff	Max. Eff
1 <input type="checkbox"/> HVAC System 1 Single zone	1					
2 <input type="checkbox"/> Heating equipment Central Furnace	1	0kBtu/h	Central Furnace			
3 <input type="checkbox"/> Cooling Equipment Field Assembly DX	1	0kBtu/h	Split DX Unit			
4 <input type="checkbox"/> HVAC System 2 Single Zone Perm.	1					
5 <input type="checkbox"/> Heating equipment Duct Furnace		0kBtu/h	Duct Furnace			
6 <input type="checkbox"/> Cooling Equipment Packaged Terminal Unit		0kBtu/h	Hydronic Coil	0 EER	11.9 EER	20 SEER

COMcheck Upgrade – Requirements



The screenshot shows the COMcheck-Web interface for a project named "Bob's test 1". The breadcrumb trail indicates the path: 90.1 (2019) Standard > Bozeman, Montana (59715) > Climate Zone 6 > Alteration. The main heading is "REQUIREMENTS" with a "Project" dropdown menu and a "SAVE" button. The interface is divided into two tabs: "PLAN REVIEW" (active) and "CONTROLS". A violation is listed with a red 'X' icon and a dropdown arrow. The text of the violation is: "[4.2.2, 8.4.1.1, 8.4.1.2, 8.7]- Plans, specifications, and/or calculations provide all information with which compliance can be determined for the electrical systems and equipment and document where exceptions are claimed. Feeder connectors sized in accordance with approved plans and branch circuits sized for maximum drop of 3%." Below this, the "Compliance Choices" section shows an unchecked checkbox for "Requirements will be met" and a text input field containing "Plans reference page/section". The left sidebar contains navigation options: Help Center, Return to Projects, TESTUSER, ENVELOPE, INTERIOR LIGHTING, EXTERIOR LIGHTING, MECHANICAL, REQUIREMENTS (highlighted), AUDIT, CHECK COMPLIANCE, REPORTS, and COLLAPSE.

COMcheck Upgrade – Audit Report



- Help Center
- Return to Projects
- TESTUSER
- ENVELOPE
- INTERIOR LIGHTING
- EXTERIOR LIGHTING
- MECHANICAL
- REQUIREMENTS
- AUDIT**
- CHECK COMPLIANCE
- REPORTS
- COLLAPSE



Bob's test 1

90.1 (2019) Standard • Bozeman, Montana (59715) • Climate Zone 6 Alteration

AUDIT

No validation errors

ENERGY CODES | 2022

2022 NATIONAL ENERGY CODES CONFERENCE
HOSTED BY THE U.S. DEPARTMENT OF ENERGY

July 19-21 | Virtual

U.S. DEPARTMENT OF
ENERGY

Office of ENERGY EFFICIENCY
& RENEWABLE ENERGY



Building Energy Codes
U.S. DEPARTMENT OF ENERGY

- If you want AIA LUs or a Certificate of Attendance for self-reporting to ICC or RESNET, WRITE DOWN THIS LINK:

www.energycodes.gov/necc/2022_credit_request

Once you have attended your **last** conference session, go to the link, request credits or a certificate, mark the sessions you attended, and submit!

NOTE: This link will only be active until Monday, July 25

THANK YOU!!!

Building Energy Codes Program

www.energycodes.gov

BECP help desk

<http://www.energycodes.gov/resource-center/help-desk>



**Pacific
Northwest**
NATIONAL LABORATORY

Thank you

