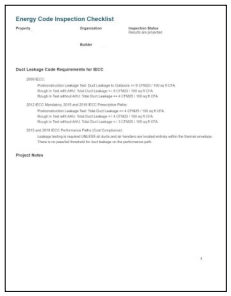
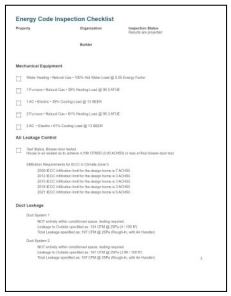
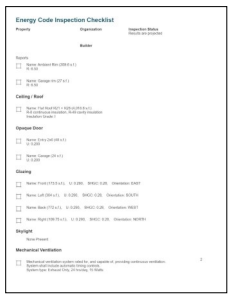
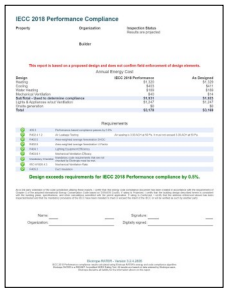
2018 Simulated Performance Alternative Path and Reading the Reports R405

Energy Code Support Program

Section R405 establishes criteria for compliance using simulated energy total building performance analysis. This compliance path option is a method of utilizing the whole building or house performance for trade-offs. It uses the twin building concept of the referenced design and proposed design, and compliance is determined by the annual energy cost for heating, cooling, service water heating, and mechanical ventilation only.

- Table R405.5.2(1) will be utilized for the building's components in both the referenced design building and the proposed design building.
- All sections and subsections listed as mandatory are required.
- Compliance of this pathway is determined if the proposed design has an annual energy cost that is equal to or less than the standard referenced design.
- Two reports are required for compliance
  - Report submitted for permit - (Proposed or projected performance)
  - Report submitted for certificate of occupancy - (Confirmed or verified performance)
- Specific information is required in the report as listed in R405.4.2
- Software is utilized in accordance with R405.6
  - Ekotrope, or REM/Rate typical, but others can be utilized when approved by code official
- Input values used shall be from an approved source



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This tables establishes the parameters that various software utilize for this compliance path. This is an example of how the table works.

Portion of **TABLE R405.5.2(1)**

SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Building component permitted for trading

How the values shall be utilized for the standard reference home (code required u-factors), and often the table to be utilized.

How the values shall be inputted for the proposed design

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass, where the proposed wall is a mass wall; otherwise, wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.4.	As proposed
	Solar absorptance = 0.75.	As proposed
	Emittance = 0.90.	As proposed

STANDARD REFERENCE DESIGN

- Wood framed
- 1000 ft^2
- R-20 but using U-value from Table R402.1.4 0.060 U-factor
- .75 Solar absorbance
- .90 Emittance

PROPOSED DESIGN

- Wood framed
- 1000 ft^2
- R-15 = 0.066 U-factor
- .80 Solar absorbance
- .85 Emittances

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Two reports are required to be submitted at two different phases of the project. These reports have specific information per the IECC that must be provided.

Compliance Report for Permit Application

1. Building street address, or other building site identification
2. Statement indicating the proposed design complies with R405.3
3. An inspection checklist documenting the building component characteristics of the proposed design as indicated in Table R405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design with user inputs to the compliance software to generate the results.
4. Site-specific energy analysis and report
5. Name of person performing the analysis and generating the report
6. Name and version of software utilized

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Compliance Report for Certificate of Occupancy

1. Building street address, or other building site identification
2. Statement indicating that the as-built building complies with R405.3
3. Certificate indication that the building passes and performance matrix for code compliance and indicating the energy saving features of the buildings.
4. Site-specific energy analysis report in compliance with R405.3
5. Name of person performing the analysis and report
6. Name and version of software utilized

Additional Information—that can be requested

1. Documentation of the building component characteristics of the standard reference design.
2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table R405.5.2(1).
3. Documentation of the actual values used in the software calculations for the proposed design.

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Ekotrope Report

Let's you know which report this is for. Projected or Per Plans (Permit Submittal)

1. Address

4. Energy analysis report

2. Statement proposed design complies with R405.3

5. Name of person creating report

6. Name and version of software

This is where the annual energy cost for the standard reference design and the proposed design.

IECC 2018 Performance Compliance

Property | **Organization** | **Inspection Status**
Results are projected

Builder

This report is based on a proposed design and does not confirm field enforcement of design elements.

Annual Energy Cost

	IECC 2018 Performance	As Designed
Heating	$1,320	$1,329
Cooling	$403	$411
Water Heating	$169	$169
Mechanical Ventilation	$40	$14
SubTotal - Used to determine compliance	**$1,931**	**$1,923**
Lights & Appliances w/out Ventilation	$1,247	$1,247
Onsite generation	$0	$0
Total	**$3,178**	**$3,169**

✓	405.3	Perform
✓	R402.4.1.2	Air Lea
✓	R402.5	Area-w
✓	R402.5	Area-w
✓	R404.1	Lighting
✓	R403.6.1	Mecha
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.
✓	IRC M1505.4.3	Mechanical Ventilation Rate
	R405.2	Duct Insulation

Design exceeds requirements for IECC 2018 Performance compliance by 0.5%.

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on DENVER County. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: ____ Signature: ____

ganization: ____ Digitally signed: ____

Ekotrope RATER - Version 3.2.4.2835

IECC 2018 Performance compliance results calculated using Ekotrope RATER's energy and code compliance algorithm.
Ekotrope RATER [illegible]ESNET Accredited HERS Rating Tool. All results are based on data entered by Ekotrope users.
Ekotrope disclaims all liability for the information shown on this report.

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3. An inspection checklist documenting the building component characteristics of the proposed design as indicated in Table R405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design with user inputs to the compliance software to generate the results.

Energy Code Inspection Checklist

Property | **Organization** | **Inspection Status**
Results are projected

Builder

General Building Information

Conditioned Area (sq ft)	8,038
Conditioned Volume (cubic ft)	83,968
Insulated Shell Area (sq ft)	16,139.7

The building energy model in Ekotrope reflects the building assemblies and energy features listed below. Sometimes energy features will change in the field from what has been modeled. The inspection process should identify any changes and ensure that the home continues to meet the applicable energy code.

Slab

☐ Name: Slab(3,256.8 s.f., 247.6 ft. exterior perimeter)
R-0 perimeter insulation, R-0 under slab insulation.

☐ Name: Walkout Slab(762 s.f., 139 ft. exterior perimeter)
R-10 perimeter insulation, R-0 under slab insulation.

Framed Floor

None Present

Foundation Wall

☐ Name: Basement Finished (Exterior Perimeter [ft]: 247.6, Height Above Grade [ft]: 1, Depth Below Grade [ft]: 9)
R-0 continuous insulation, R-15 cavity insulation
Insulation Grade: I
Feet from top of wall to top of insulation: 0, Feet from top of wall to bottom of insulation: 0

Above Grade Wall

☐ Name: All ext (4,967 s.f.)
R-0 continuous insulation, R-23 cavity insulation
Insulation Grade: I

☐ Name: Garage 2x6 new (272.5 s.f.)
R-0 continuous insulation, R-23 cavity insulation
Insulation Grade: I

Rim Joist

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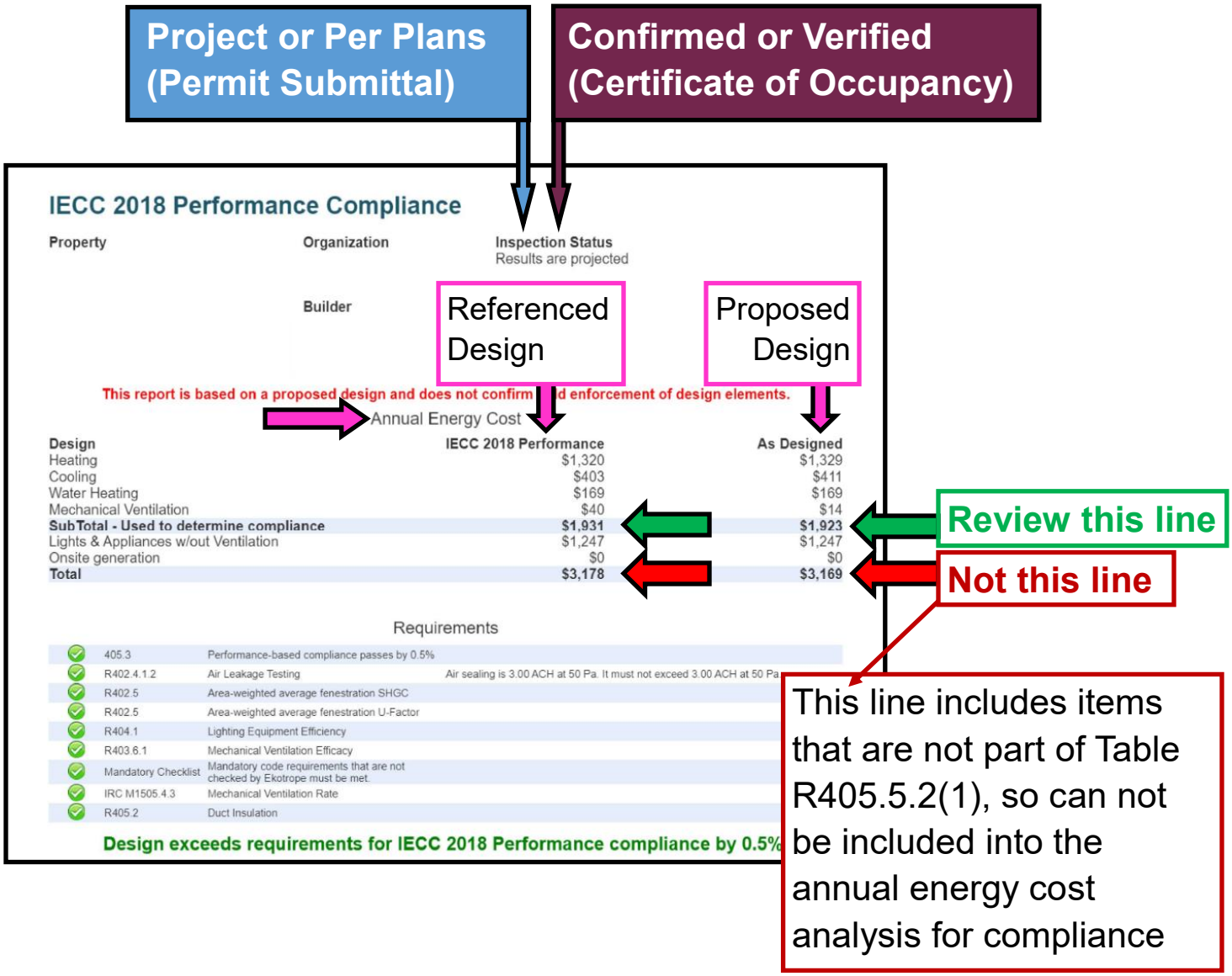
Compliance is determined by the annual energy cost. If the proposed design is equal to or less than the reference design it is considered to be compliant with the path.



Always review the sub total line item to determine compliance for this path.

Keep an eye on the cost difference between the two columns. When the amount is close to each other's values the results of what is actually installed in the field can impact if the project will comply with this path when the second report is generated.

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IECC 2018 Performance Compliance

BUILDTank

Property
Example House

Organization
BuildTank, Inc.
Robby Schwarz

Inspection Status
Results are projected

Builder

This report is based on a proposed design and does not confirm field enforcement of design elements.

Annual Energy Cost

Design	IECC 2018 Performance	As Designed
Heating	$500	$424
Cooling	$120	$123
Water Heating	$164	$164
Mechanical Ventilation	$44	$23
SubTotal - Used to determine compliance	**$828**	**$734**
Lights & Appliances w/out Ventilation	$755	$755
Onsite generation	$0	$0
Total	**$1,583**	**$1,489**

R405.3 Source Energy Exception: The proposed home uses 11.3 MBtu LESS source energy than the reference home.

R405.3 - Energy prices shall be taken by an approved source. This can be one of the sources listed in the section as approved by the code official for example Xcel Energy is permitted. The exception allows for the use of Btu or Btu per square foot of conditioned area. This has been provided.

IECC 2018 Performance Compliance

Property

Organization

Inspection Status
Results are projected

Builder

This report is based on a proposed design and does not confirm field enforcement of design elements.

Annual Energy Cost

Design	IECC 2018 Performance	As Designed
Heating	$1,320	$1,329
Cooling	$403	$411
Water Heating	$169	$169
Mechanical Ventilation	$40	$14
SubTotal - Used to determine compliance	**$1,931**	**$1,923**
Lights & Appliances w/out Ventilation	$1,247	$1,247
Onsite generation	$0	$0
Total	**$3,178**	**$3,169**

Example where the sources were not provided, like the example above

Requirements

The energy prices used for this analysis was not provided for this report.