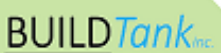
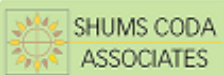
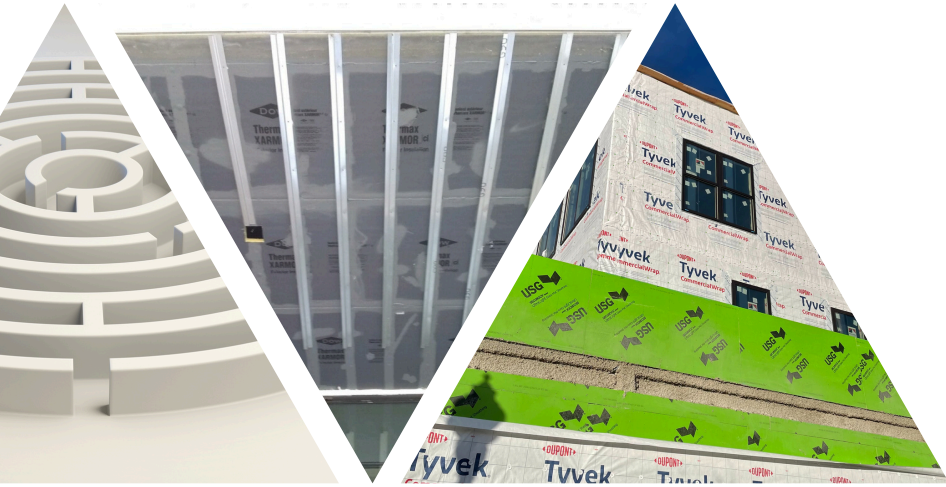




2018 IECC COMMERCIAL ENERGY COMPLIANCE PATHS

BUILDING CODE SUPPORT PROGRAM



COMPLIANCE PATHS: THE BASICS

All projects are required to choose an **energy compliance path** as part of complying with the International Energy Conservation Code (IECC). The energy compliance path determines parts of building's design and the level of flexibility that will be incorporated into the project.

The energy compliance path is required to be noted on the building plans (C104.3) and is an integral part of performing a plan review or inspections. The compliance path options can be found in Section C401.2 of the 2018 IECC.

Prescriptive— which is an umbrella for three options:

- **Insulation Component R-Value Based Method - C402.1.3**
- **Assembly U-Factor, C-Factor, or F-Factor Based Method - C402.1.4**
- **Component Performance Alternative (COMcheck) - C402.1.5**

Total Building Performance

ASHRA Standard 90.1— separate Standard for energy, recognized by the IECC as an optional compliance path.

PRESCRIPTIVE

**TOTAL BUILDING
PERFORMANCE**

ASHRAE 90.1

**Insulation Component
R-value Based Method**

**U-factor, C-factor, F-
factor Based Method**

**Component
Performance Alternative**

Prescriptive- Insulation Component R-Value Based Method

This prescriptive compliance pathway method is the “code-book-recipe” approach. No substitutions, just do what the book says on this one. This option does not allow for any trading of values or requirements for the thermal envelope insulation R-values or fenestration U-factors values, or air leakage results, mechanical provisions, or lighting provisions.

Thermal envelope is based on Tables C402.1.3, C402.4, & C402.5.4

- The R-values listed in the table are the minimum values permitted
- The U-factors & SHGC are the maximum values permitted.
- Air Barrier and air sealing is based on Section C402.5
- All sections C401.2 through C408.3.2.3 apply if applicable in the design
- Everything should be placed on the plans– items found in C103.2 and C103.2.1
- No thermal envelope energy compliance report is required.
 - Interior Lighting compliance certificate, Mechanical compliance certificate, and Exterior Lighting compliance certificate produced COMcheck can be submitted to demonstrate compliance with other sections of the IECC.

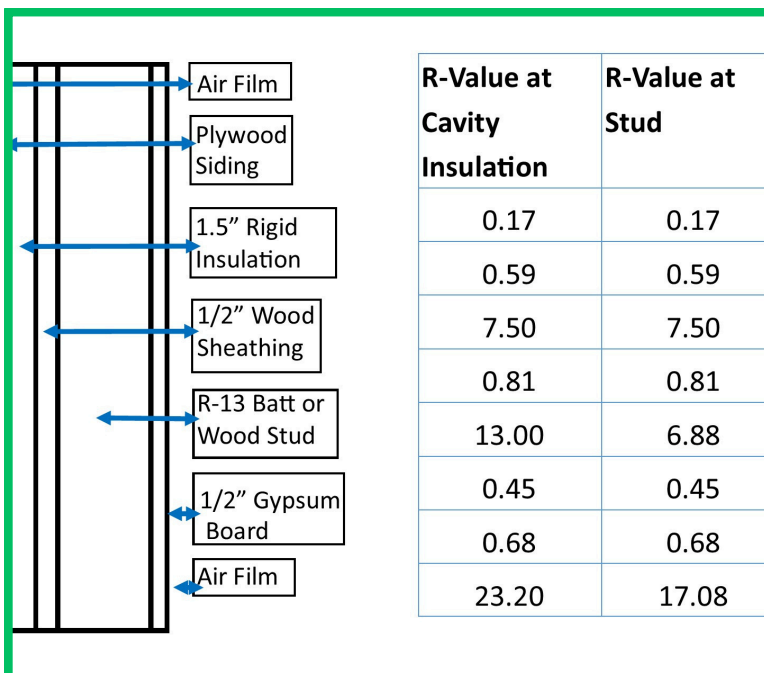


Prescriptive- Assembly U-Factor, C-Factor, or F-Factor Based Method

This prescriptive compliance pathway method takes an entire assembly approach to comply with the energy code. Because of the substantial documentation this method requires, it's not used very often. This option does not allow for any trading of values or requirements for the thermal envelope insulation values or fenestration U-factors values, or air leakage results, or mechanical provisions, or service water heating, or lighting.

Thermal envelope is based on Tables C402.1.4, C402.4, & C402.5.4

- Calculation of the proposed assembly values based on the ASHRAE Book of Fundamentals and ASHRAE 90.1 Appendix A are acceptable.
- Air Barrier and air sealing is based on Section C402.5
- All sections C401.2 through C408.3.2.3 apply if applicable in the design
- Everything should be placed on the plans– items found in C103.2 and C103.2.1
- No thermal envelope energy compliance report is required
 - Interior Lighting Compliance Certificate, Mechanical Compliance Certificate, and Exterior Lighting Compliance Certificate produced COMcheck can be submitted



Prescriptive- Component Performance Alternative (COMcheck)

This is the most flexible method for the prescriptive path, because it allows for some trading of the thermal envelope with the exception of the Solar Heat Gain Coefficient (SHGC) of the fenestration.

This method uses the twin building concept: it starts with a reference design building using values of Table C402.1.4 and C402.4 with the exception of the SHGC. The proposed design building contains the thermal envelope values the designer would like to use. To determine compliance, the two are compared in a report using the U-Factor, C-Factor, F-Factor method. When the report can show the proposed design is just as efficient or better than the referenced design, the design complies with the IECC.

Thermal envelope allows trading

- COMcheck—Thermal Envelope Compliance Certificate
- Air Barrier and air sealing is based on Section C402.5
- All sections C401.2 through C408.3.2.3 apply if applicable in the design
- Everything should be placed on the plans— items found in C103.2 and C103.2.1
 - Interior Lighting Compliance, Mechanical Compliance Certificates, and Exterior Lighting Compliance Certificate produced by COMcheck can be submitted



COMcheck Software Version COMcheckWeb

Envelope Compliance Certificate

Project Information

| | | | |
|-------------------------------|---------------------------------|--|--|
| Energy Code: | 2021 IECC | | |
| Project Title: | Test office 2021 San Antonio Tx | | |
| Location: | San Antonio, Texas | | |
| Climate Zone: | 2a | | |
| Project Type: | New Construction | | |
| Vertical Glazing / Wall Area: | 7% | | |

| | | |
|--------------------|--------------|----------------------|
| Construction Site: | Owner/Agent: | Designer/Contractor: |
| New Address | Joe Smith | Bob Builder |

Additional Efficiency Package(s)
 Credits: 10.0 Required, 15.0 Proposed
 Reduced lighting power, 15.0 credit

| Building Area | Floor Area |
|---------------------------|------------|
| 1-Office : Nonresidential | 6000 |

| Envelope Assemblies | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Proposed U-Factor | Budget U-Factor _(e) |
|---|-------------------------|----------------|---------------|-------------------|--------------------------------|
| Roof: Insulation Entirely Above Deck, 3-Year-Aged Solar Reflectance Index = 64.00 (c), [Bldg. Use 1 - Office] | 12500 | --- | 25.0 | 0.039 | 0.039 |
| Ext. Wall: Steel-Framed, 24in. o.c., [Bldg. Use 1 - Office] | 6000 | 13.0 | 5.0 | 0.070 | 0.077 |
| Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending, SHGC 0.25, [Bldg. Use 1 - Office] (b) | 384 | --- | --- | 0.290 | 0.450 |
| Door: Glass (over 50% glazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID Pending, SHGC 0.25, [Bldg. Use 1 - Office] (b) | 63 | --- | --- | 0.290 | 0.770 |

Total Building Performance

Total Building Performance uses modeling and design to trade-off systems and components to allow for compliance when compared with a prescriptive building. This energy code compliance pathway allows for evaluating the performance of the building as a whole, and allows for trading of components beyond the thermal envelope, hence “Total Building Performance”.

This compliance path also uses the twin building concept. The standard reference design is based on the values in the applicable column of Table C407.4.1(1). The proposed design of the building will input the proposed values as indicated in the applicable column of Table C407.4.1(1). To determine compliance the proposed design must demonstrate the annual energy cost is 80% or less than the standard reference design. An energy compliance report is required to be provided at permit submittal for review.

- **Energy performance report**

- Demonstrate the annual energy cost of proposed design < 85% of the standard reference design
- The information must include all the information required by Sections C407.3.1 and C407.3.2, if applicable
- Air Barrier and air sealing is based on Section C402.5
- All sections listed as mandatory in other sections must be complied with.
- Everything should be placed on the plans– items found in C103.2 and C103.2.1

**Reference Design Building
Annual Energy Cost - \$1,000**

**Proposed Design Building
Annual Energy Cost - \$800**



ASHRAE Standard 90.1 - 2016 Edition

For commercial projects the IECC does recognize ASHRAE as a compliance pathway equivalent to the provisions of the IECC. A pathway created by using a separate Standard as the only means of compliance for all systems.

Many of the energy efficiency concepts found in the IECC are also found in 90.1, but the approach to it may differ slightly.

- There are provisions in 90.1 that are more stringent than what you would find in the IECC and there are provisions in the IECC that are more stringent than what is found in 90.1.
- If the choice is to utilize 90.1 you must stick to it for the entirety of the project. No cherry picking which provision from 90.1 or the IECC a building would use. **It is an all or nothing requirement.**
- 90.1 does utilize the same concepts and has provisions that are mandatory, and then offers prescriptive and performance requirements.
- 90.1 does have its own documentation requirements for compliance that will need to be provided for compliance.
- The free software COMcheck does provide documentation of compliance for 90.1. COMcheck is a useful tool to demonstrate some of the compliance requirements.
- 90.1 has similar compliance paths found in the IECC.

PRESCRIPTIVE**ENERGY COST
BUDGET****PERFORMANCE
RATING APPENX G****R-Value****U-Factor****Envelope Trade Off
Appendix C**