

## RESIDENTIAL ENERGY CONSERVATION PRESCRIPTIVE REQUIREMENTS

### 1. Introduction

Montgomery County has adopted and is currently enforcing the 2018 Edition of the International Energy Conservation Code (IECC). The IECC replaces Chapter 11 of the International Residential Code. All permit applications submitted after May 20, 2020 shall comply with the provisions of the 2018 IECC. Prescriptive Energy requires compliance with sections R401 through R404 of the 2018 IECC. This includes all the prescriptive and mandatory Residential Requirements. The design of the energy-efficient building envelope, consisting of roof/ceiling, walls, floors, foundation assemblies that surround the conditioned space, must address insulation, fenestration, air leakage and the selection and installation of energy efficient mechanical and service water heating.

### 2. Applicability

Existing buildings and historic designated buildings are exempt from these codes. New work in alterations, change of occupancy, renovations or repairs must comply with the requirements of these codes without creating or extending any nonconformity in the existing building related to energy efficiency, including the capacity of the mechanical systems. Unconditioned additions separated from the existing building by building thermal envelope assemblies are exempted from complying with the building envelope requirements. A conditioned addition alone must comply with the code requirements; alternatively, the existing building and addition can comply with code requirements as one building.

### 3. Montgomery County Climate Zone

The code establishes many requirements such as wall and roof insulation *R*-values, window and door thermal *U*-factors as well as provisions that affect the mechanical systems based upon the climate where the building is located. Montgomery County is in Climate Zone 4A. The table below represents the thermal criteria for Montgomery County:

Climate Zone	Thermal Criteria	
	IP Units	SI Units
<b>4A</b>	CDD50°F ≤4500 and HDD65°F≤5400	CDD10°C≤2500 and HDD18°C3000

*CDD: Cooling degree day. HDD: Heating degree day. For SI: °C = [°F-32]/1.8*

The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72° F (22° C) for heating and minimum of 75° F (24° C) for cooling.

## 4. Plan Submittal Requirements

**Prescriptive Energy Compliance can be demonstrated using one of the following options:**

1. R-Values Worksheet (page 3)
2. Equivalent U-Factors Worksheet (page 4)
3. Total UA Alternative, REScheck™ or equivalent (page 5)

**General Requirements for all options:**

1. The exact location of the building thermal envelope shall be marked out on the plans, details, and cross-sections. The building thermal envelope shall comply with the requirements of Sections R402.1.1 through R402.1.5
2. Provide all insulation R-values or U-factors, materials, and locations to be installed (walls, ceilings, cantilever floors, floors over garage, crawl space, basement walls, etc.). Per Tables: R402.1.2 or R402.1.4 or R402.2.6 for Steel-Framed construction. This information shall be captured on the Residential Energy Compliance Certificate (See sample on page 6).
3. Provide all fenestration U-factors for all glazing for each window and door per Table R402.1.2 (schedule supplied by designer).
4. Provide details on how all areas listed in Section R402.4.1.1 (table) will be protected against air leakage.
5. Indicate if crawlspace(s) are conditioned or vented; exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped/sealed.
6. Indicate duct insulation R-values, minimum R-6, R-8 in attics. Insulation not required if ductwork is completely within the building thermal envelope.
7. Indicate duct sealing methods per IRC M1601.4.1. <sup>1</sup>

The information required in points 1 and 2 can be summarized on worksheets located on page 3 for R-values or on page 4 for U-Factors. The remaining information can be captured on the drawings in schedules, notes, and other supplementary worksheets or calculations.

When a mechanical permit is required for installation of HVAC equipment, the applicant for mechanical permit must provide the ACCA Manual J 8th edition calculation package for the HVAC Equipment Sizing.

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<sup>1</sup> Section 103.2 Information on Construction Documents. "Details shall include...Insulation materials and R-values, fenestration U-factors, area-weighted U-factor calculations, mechanical system design criteria, mechanical and service water heating system and equipment types sizes and efficiencies, equipment and system controls, duct sealing, duct and pipe insulation and locations, lighting fixture schedule with wattage and control narrative, and air sealing details."

## PRESCRIPTIVE WORKSHEET (R-Values)

Applicant Name: \_\_\_\_\_

Date: \_\_\_\_\_

Building Address \_\_\_\_\_

Permit (A/P) # \_\_\_\_\_

CRITERIA		REQUIRED	PROVIDED	ASSEMBLY DESCRIPTION
<b>WINDOWS/DOORS GLAZED FENESTRATION</b>	<b>MAX. U-FACTOR</b>	0.32		
	<b>MAX. SHGC</b>	0.4		
<b>SKYLIGHTS</b>	<b>MAX. U-FACTOR</b>	0.55		
	<b>MAX. SHGC</b>	0.4		
<b>CEILING</b>	<b>MINIMUM R-VALUE</b>	R-49		
<b>WALLS</b> (wood framing)		R-20 or 13+5		
<b>MASS WALLS</b>		**R-8/13		
<b>BASEMENT WALLS</b>		*R-10/13		
<b>FLOORS</b>		R-19		
<b>SLAB PERIMETER</b> R-value, depth		R-10, 2ft		
<b>CRAWL SPACE WALLS</b>		*R-10/13		

\***The first R-value** applies to continuous insulation, the second to framing cavity insulation. "10/13 means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall."

\*\***The second R-value** applies when more than half the insulation is on the interior of the mass wall. Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value.

**Thermally Isolated Sunroom, Check box if applicable.**

- Minimum Ceiling R-Value for Sunroom (R-19)
- Minimum Wall R-Value (R-13)
- New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements.

I hereby certify that the building design represented in the attached construction documents has been designed to meet or exceed the requirements of: <sup>2</sup>

**2018 Edition International Energy Conservation Code (IECC)**

\_\_\_\_\_  
Builder/Designer/Contractor

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Date

<sup>2</sup> Section R103.3.1 "Documents shall be endorsed and stamped "Reviewed for Code Compliance." Section R103.3.3 provides provision for *Phased Approval*. "The code official shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or approved, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted."

## PRESCRIPTIVE WORKSHEET (Equivalent U-factors)

Applicant Name: \_\_\_\_\_

Date: \_\_\_\_\_

Building Address \_\_\_\_\_

Permit (A/P) # \_\_\_\_\_

Criteria		Required	Provided	Assembly Description
GLAZED FENESTRATION	Max. U-Factor	0.32		
	Max. SHGC	0.4		
SKYLIGHT	Max. U-Factor	0.55		
	Max SHGC	0.4		
CEILINGS	Max. U-Factor	0.026		
FRAME WALL		0.06		
MASS WALL		0.098		
FLOOR		0.047		
BASEMENT WALL		0.059		
CRAWL SPACE WALL		0.065		

GLAZING U-FACTORS must be tested and documented by the manufacturer in accordance with the National Fenestration Rating Council (NFRC 100) test procedure or taken from the Default Tables R303.1.3(1) and R303.1.3(2) in the 2018 IECC, Chapter 3. Non-fenestration U-factors must be determined from measurement, calculation, or approved sources for each component

I hereby certify that the building design represented in the attached construction documents has been designed to meet or exceed the requirements of:

2018 Edition International Energy Conservation Code (IECC)

\_\_\_\_\_  
Builder/Designer/Contractor

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Date

## **PRESCRIPTIVE COMPLIANCE (Total UA Alternative or REScheck™)**

Provide all information as outlined in points 1 thru 6 on page 2 and documentation that describes each building thermal envelope component and the overall envelope conformance.

Alternately, provide a copy of REScheck calculations. The submitted REScheck printout shall show all of the following specific information: orientation of each individual wall; insulation types, R-values and whether continuous or cavity; accurate square footage; and accurate window and door sizes and the specific wall in which they are located, along with the U factor.

Builders who have model house plans shall provide the worst-case orientation for the REScheck (based on the orientation of the exterior walls). Subsequent submissions will indicate if each proposed building exceeds the worst-case scenario or new REScheck calculations shall be provided with the application.

If the total *building thermal envelope* UA (sum of *U*-factor times assembly area) is less than or equal to the total UA resulting from using the *U*-factors in Table 402.1.4 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table 402.1.2. The UA calculation shall be done using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials.

### **REScheck™**

Montgomery County accepts REScheck™ program as a tool for energy code compliance. The REScheck™ program can be downloaded at [www.energycodes.gov](http://www.energycodes.gov). An online version of REScheck™ (REScheck Web) can be utilized without having to download or install any software on your computer. A Montgomery County approved report can be printed after entering required information. Before printing the report choose the correct code approved by Montgomery County (2018 IECC) and then print.

# ENERGY EFFICIENCY CERTIFICATE OF COMPLIANCE

Address \_\_\_\_\_

RESIDENTIAL COMPLIANCE PATH

(ONLY ONE SHALL APPLY)

Permit # \_\_\_\_\_

Prescriptive R	<input type="checkbox"/>	Prescriptive U	<input type="checkbox"/>
Prescriptive UA	<input type="checkbox"/>	Performance	<input type="checkbox"/>

## Component Values

Building Envelope Air Leakage: _____ Air Changes Per Hour (Max 3)	Duct System Air Leakage: _____ cfm per 100sf
	Post Construction Testing <input type="checkbox"/> Rough-in Testing <input type="checkbox"/>
Ceiling R or U-value: _____	Heating System Efficiency: _____
Wood Frame Wall R or U-value: _____	Cooling System Efficiency: _____
Mass Wall R or U-value: _____	Water Heating Efficiency: _____
Floor R or U-value: _____	Basement Wall R-value: _____
Slab R-value: _____ Depth: _____	Crawl Space R-value: _____
Crawl Space R-value: _____	Gas Fired Unvented Room Heater: <input type="checkbox"/>
Fenestration U-value: _____ SHGC: _____	Electric Furnace: <input type="checkbox"/>
Skylight U-factor: _____ SHGC: _____	Baseboard Electric Heat: <input type="checkbox"/>
Ducts Outside of Thermal Envelope R-value: Supply R-8 <input type="checkbox"/> Other R-6 <input type="checkbox"/>	

I certify the information contained on the certificate is true and complete:

Builder/Designer: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

(CUT)

**The International Energy Conservation Code 2018 requires a *Certificate*, listing the energy conservation measures, be posted on a wall in the space where the furnace is located, a utility room or an approved location in the building at the time of the project's final inspection.**

A Certificate of Compliance is required anytime a building permit is issued with an Energy Compliance Form. Requirements for the certificate are listed in the code section below.

### IECC 2018 Chapter 4, Section R401.3 Certificate

**R401.3 Certificate (Mandatory).** A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and floor) and ducts outside conditioned spaces; U-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

**For the purpose of this Certificate, permanent shall mean:** A type printed sticker, or a laminated printed paper; laminated certificates must be glued. The in-fill information is permitted to be handwritten under the categories of the printed certificate. Fully handwritten certificates shall not be allowed or deemed acceptable.

A sample printed Energy Efficiency Certificate is included above. You are free to use or copy this sample certificate, or, Energy Efficiency Certificate stickers can be purchased from the [International Code Council Store](http://www.iccs.org).