

# Lebanon County Planning Department Energy Compliance Worksheet PA Climate Zone - Central(5)

Project Address: \_\_\_\_\_ Date: \_\_\_\_\_

Contractor: \_\_\_\_\_ Submitted by: \_\_\_\_\_

**SECTION 1 - PA UCC Energy Compliance Path** (Select one option below)

1. PA Alternative Residential Energy Provisions - Fill out Section 1A below
2. IRC Chapter 11 (or IECC Chpt. 4) - Fill out Section 1B on page 3
3. Performance based Compliance - REScheck or other: \_\_\_\_\_  
\*Provide documentation and continue to Section 2 on page 4

**SECTION 1A - PA Alternative Residential Energy Provisions(2021 Provisions)**

\*Fill out **ONLY** if using PA Alternative Energy Provisions

Click [HERE](#) for the full PA Alternative Energy Provisions

**PA 104 Entrance requirements.** This compliance path allows for some reductions in energy efficiency that will allow simplified enforcement and construction. To utilize the PA Alternative Energy Provisions, the building owner or agent must choose at least one of the energy enhancement options in Table PA104.

**Option selected:** \_\_\_\_\_ (Choose an option number from the table below)

**Table PA104**  
*Energy Enhancement Options*

Option	Description	Minimum efficiency by climate zone			
		South (4)	Central (5)	North (6)	
1	Ductless heat pumps <sup>a</sup>		10 HSPF and 15 SEER		
2	All air ducts located inside the thermal envelope		Compliant		
3	Geothermal or water source heat pump installed <sup>a</sup>		Compliant		
4	Improved efficiency air source heat pump installed <sup>a</sup>		9.5 HSPF and 19 SEER		
5	Improved efficiency condensing furnace installed <sup>a</sup>		95 AFUE		
6	Exterior continuous insulation		R20+10		
7	Improved efficiency windows		U-factor = 0.19		
8	Package: Improved efficiency windows and higher attic R-value with raised heel truss <sup>b</sup>		Windows		U-factor = 0.21
			Attic		R-value = 60
9	Package: Improved efficiency windows and heat pump water heater	Windows	U-factor = 0.21		
		Heat Pump Water Heater	Compliant		

Notes:

- a. For multiple cooling systems, all systems shall meet or exceed the minimum efficiency requirements in this section and shall be sized to serve 100 percent of the cooling design load. For multiple heating systems, all systems shall meet or exceed the minimum efficiency requirements in this section and shall be sized to serve 100 percent of the heating design load.
- b. Full height of uncompressed insulation shall extend over the top plate at the eaves.

**\*Continue SECTION 1A on page 2**

**SECTION 1A continued - PA Alternative Residential Energy Provisions**

**PA 301 Insulation and fenestration criteria.** The building thermal envelope shall meet the requirements of Table PA301 based on the climate zone specified in PA201.

**Table PA301 - Insulation and Fenestration Requirements by Component<sup>a</sup>**

Climate Zone	Fenestration <sup>b</sup> U-factor	Skylights <sup>b</sup> U-factor	Glazed Fenestration SHGC <sup>b,e</sup>	Ceiling R-value	Wood Frame Wall R-value	Mass Wall R-value <sup>h</sup>	Floor R-value	Basement <sup>c</sup> Wall R-value	Slab <sup>d</sup> R-value and depth	Crawlspace <sup>c</sup> Wall R-value
Central (5)	0.30	0.55	NR	49	20 <sup>i</sup> or 13+5 <sup>g</sup>	13/17	30 <sup>f</sup>	10/13	10, 2 ft	10/13
Proposed			NR							

**Notes:**

- a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
- b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.  
*Exception:* In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such sky lights does not exceed 0.30.
- c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation on the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
- d. For heated slabs, refer to requirements in 2018 IRC Table N1102.1.2 (R402.1.2) and 2018 IRC Section N1102.2.10 (R402.2.10).
- e. There are no SHGC requirements in the Marine Zone.
- f. Alternatively, insulation sufficient to fill the framing cavity providing not less than an R-value of R-19.
- g. The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- h. Mass walls shall be in accordance with Section N1102.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.
- i. R-18 insulation shall be permitted in place of R-20 requirement provided the wall framing factor is 20% or less or exterior walls with 24" on center nominal vertical stud spacing.

**Ceiling Insulation Reductions - Select one option ONLY if applicable**

This ceiling has attic space above and will be using raised heel trusses or stick framing with a large enough heel height so that the insulation will not be compressed over top of the wall top plates. **R-38 insulation will be used.** See Section PA302.1 of PA Alternative.

This ceiling does NOT have attic space above and does NOT provide adequate space for R-49 insulation. **R-30 insulation will be used, but is limited to 75% of the total living space sq. ft.** See PA302.2 of PA Alternative.

**Attic Access - CONFIRM required installation by checking below**

Attic access hatches will be weatherstripped and insulated with rigid foam to a minimum of R-20. An insulation baffle will be provided to retain all loose-fill insulation around the access hatch. See PA302.3 in PA Alternative

**Please provide any additional notes or details regarding PA Alternative Energy Requirements**

**\*End of SECTION 1A. Skip to SECTION 2 on page 4**

**SECTION 1B - IRC Chapter 11 (2015 International Residential Code or IECC Chpt. 4)**\*Fill out **ONLY** if using IRC Chapter 11 RequirementsClick [HERE](#) to view the 2018 International Residential Code through the PA L & I website.Table Based on N1102.1.2 (IRC) - *Insulation and Fenestration Requirements by Component<sup>a</sup>*

Climate Zone	Fenestration <sup>b</sup> U-factor	Skylights <sup>b</sup> U-factor	Glazed Fenestration SHGC <sup>b e</sup>	Ceiling R-value	Wood Frame Wall R-value	Mass Wall R-value <sup>i</sup>	Floor R-value	Basement <sup>c</sup> Wall R-value	Slab <sup>d</sup> R-value and depth	Crawlspace <sup>c</sup> Wall R-value
Central (5)	0.30	0.55	NR	49	20 or 13+5 <sup>h</sup>	13/17	30 <sup>g</sup>	15/19	10, 2 ft	15/19
<b>Proposed</b>			<b>NR</b>							

NR = Not Required.

- R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
- The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation on the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
- R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
- There are no SHGC requirements in the marine Zone.
- Alternatively, insulation sufficient to the the framing cavity providing not less than an R-value of R-19.
- The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- Mass walls shall be in accordance with Section N1102.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

**Ceiling Insulation Reductions - Select one option ONLY if applicable**

This ceiling has attic space above and will be using raised heel trusses or stick framing with a large enough heel height so that the insulation will not be compressed over top of the wall top plates. **R-38 insulation will be used.** See N1102.2.1 of International Residential Code (2018).

This ceiling does NOT have attic space above and does NOT provide adequate space for R-49 insulation. **R-30 insulation will be used, but is limited to the lesser of 500 sq. ft. or 20% of the total ceiling area.** See N1102.2.2 of International Residential Code (2018).

**Attic Access - CONFIRM required installation by checking below**

Attic access hatches will be weatherstripped and insulated to an equivalent of the surrounding insulation. An insulation baffle will be provided to retain all loose-fill insulation around the access hatch.

Please provide any additional notes or details regarding IRC Chapter 11 requirements

\*End of SECTION 1B. Continue to SECTION 2 on page 4

**SECTION 2 - Mechanical Equipment and HVAC Systems**

\*Must fill out applicable information for **ALL PROJECTS**. (New construction & Additions)

**TABLE 2A - Equipment Information**

Appliance	Fuel	Manufacturer	Model Number	Efficiency
A/C (if applicable)				
Hot Water Heater				
Fireplace (if applicable)				

\*Provide specs for range hood if unit is over 400 cfm, and include info for required make-up air below

Please provide any additional notes/details regarding any mechanical equipment

**Mechanical System Piping**

All piping capable of carrying fluids above 105 deg. or below 55 deg. will be insulated to an R-3

Hot water piping outside conditioned space and as required by the IRC will be insulated to R-3 (See IRC 1103.5.3)

**HVAC Duct Insulation**

R-8 will be used for all ductwork (3" dia. or greater) in attic space. R-6 for less than 3" dia.

R-6 will be used all other ductwork (3" dia. or greater) outside of conditioned space. R-4.2 for less than 3" dia.

**Duct Testing - Required for NEW CONSTRUCTION projects only. Applies to ALL energy compliance paths.**

\*Indicate selected option or exception below

**Option 1: Post-construction test.** Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler closure. All register boots shall be taped or otherwise sealed during the test.

**Option 2: Rough-in test.** Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure if installed at the time of test. All register boots shall be taped or otherwise sealed during the test.

**Exception:** Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

**Duct Testing.** The total leakage of the ducts, where measured in accordance with section PA402.3, shall be less than or equal to the values shown.

*Duct Leakage Targets*

Duct Testing Option	Total Leakage (cfm/100ft <sup>2</sup> )
Rough-in with air handler	4
Rough-in without air handler	3
Post-construction	4

### SECTION 3 - Air Leakage and Testing

\*Required for ALL projects. Blower door testing for NEW CONSTRUCTION only.

#### Sealing of the Building Thermal Envelope

\* The building thermal envelope is required to be constructed and sealed to limit air infiltration, per PA304 of the PA Alternative or N1102.4 of the IRC.

NEW CONSTRUCTION - The required blower door testing will be performed and reported prior to final inspection. Air leakage must be less than 3 ACH when tested at 0.2 inches w.g. (50 Pascals) in accordance with RESNET/ICC 380, ASTM E 779, or ASTM E 1827. See PA Alternative 304.1.2 or IRC N1102.4.1.2 for additional details.

ADDITIONS or other permitted alterations - The required air sealing will be inspected visually at framing inspection.

### SECTION 4 - Whole House Mechanical Ventilation

\*Required for NEW CONSTRUCTION Only. N/A for additions or other alterations.

#### Requirement for Mechanical Ventilation

\* All new homes are required to have mechanical ventilation installed, regardless of what energy path is selected. This is a requirement of the IRC, Section 303.4, due to the required air leakage rate of less than 5 ACH.

#### Installation of Mechanical Ventilation

\* See Section M1505 of the IRC (2018) for full requirements. Use tables from IRC below to provide required information.

**TABLE M1505.4.3(1)**  
**CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS**

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s.

**TABLE M1505.4.3(2)**  
**INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS<sup>a, b</sup>**

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor <sup>a</sup>	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.

b. Extrapolation beyond the table is prohibited.

- Required Airflow: \_\_\_\_\_ CFM from Table M1505.4.3(1) above.
- CONTINUOUSLY RUNNING  
INTERMITTENT | Intermittent run % \_\_\_\_\_ | Adjusted Airflow Required \_\_\_\_\_ CFM
- What system will you be using to provide the required airflow?  
EXHAUST ONLY(ex. bathroom fan) - Make/Model \_\_\_\_\_  
SUPPLY ONLY (ex. fresh air duct into return system)  
BALANCED (ex. fresh air duct into return with heat exchanger and exhaust vent)
- Label manual override switch with "WHMV" or equivalent.