

PNNL 2024 R405 Option 1

Improves thresholds 10% and removes CZ 5 H/ERV requirement from Standard Reference Design (SRD)

Note: The Option 1 and Option 2 language does not reflect the graduated steps proposed for R406 and will need to be aligned.

R405.2 Simulated building performance compliance. Compliance based on simulated building performance requires that a building comply with the following:

1. The requirements of the sections indicated within Table R405.2.
2. For structures less than 1,500 square feet of conditioned floor area, the annual site energy consumption shall be less than or equal to ~~64~~ 58 percent of the annual site energy consumption of the standard reference design.
3. For structures 1,500 to 5,000 square feet of conditioned floor area, the annual site energy consumption shall be no more than ~~47~~ 42 percent of the standard reference design.
4. For structures over 5,000 square feet of conditioned floor area, the annual site energy consumption shall be no more than ~~44~~ 37 percent of the standard reference design.
5. For structures serving Group R-2 occupancies, the annual site energy consumption shall be less than or equal to ~~64~~ 55 percent of the annual site energy consumption of the standard reference design. See Section R401.1 and residential building in Section R202 for Group R-2 scope.

Energy use derived from simulation analysis shall be expressed in Btu per square foot of conditioned floor area per year.

**TABLE R405.2
REQUIREMENTS FOR SIMULATED BUILDING PERFORMANCE**

Section^a	Title	Contents
R403.6	Mechanical ventilation	Except R403.6.1

{rest of table unchanged}

PNNL 2024 R405 Option 2

improves thresholds 8% but makes no changes to the mandatory sections for R405 or what is assumed for the SRD

R405.2 Simulated building performance compliance. Compliance based on simulated building performance requires that a building comply with the following:

1. The requirements of the sections indicated within Table R405.2.

2. For structures less than 1,500 square feet of conditioned floor area, the annual site energy consumption shall be less than or equal to ~~64~~59 percent of the annual site energy consumption of the standard reference design.
3. For structures 1,500 to 5,000 square feet of conditioned floor area, the annual site energy consumption shall be no more than ~~47~~43 percent of the standard reference design.
4. For structures over 5,000 square feet of conditioned floor area, the annual site energy consumption shall be no more than ~~44~~38 percent of the standard reference design.
5. For structures serving Group R-2 occupancies, the annual site energy consumption shall be less than or equal to ~~64~~56 percent of the annual site energy consumption of the standard reference design. See Section R401.1 and residential building in Section R202 for Group R-2 scope.

Energy use derived from simulation analysis shall be expressed in Btu per square foot of conditioned floor area per year.

Option 3

The R405 values as proposed in Options 1 and 2 do not mirror the R406 change from 3 single-family home size categories to 10. PNNL has confirmed that is possible to produce these values in time to submit them during the CR-102 public comment period but not in time for this MVPE meeting. This meeting (and the subsequent Council meeting) should help confirm the modeling assumptions for this analysis and inform the relative prioritization of work on the 2024 WSEC-R Performance Paths (R405 and R408/ERI).

If placeholder code language is needed to convert the structure to R405 to mimic changes to R406, the following could be used. [Note: Item 2 is reserved for alignment with national model code. Also, I know Table R405.2(2) would be the correct titling, but I am calling it R405.3 for simplicity as this temporarily avoids having to also include all the renumbering of Table R405.2 to R405.2(1).]

R405.2 Simulated building performance compliance. Compliance based on simulated building performance requires that a building comply with the following:

1. The requirements of the sections indicated within Table R405.2.
2. Reserved
3. ~~For structures less than 1,500 square feet of conditioned floor area, the~~ The annual site energy consumption of the proposed design shall be less than or equal to ~~64 percent~~ the corresponding percentage in Table R405.3 of the annual site energy consumption of the *standard reference design*.

3. ~~For structures 1,500 to 5,000 square feet of conditioned floor area, the annual site energy consumption shall be no more than 47 percent of the standard reference design.~~
4. ~~For structures over 5,000 square feet of conditioned floor area, the annual site energy consumption shall be no more than 41 percent of the standard reference design.~~
5. ~~For structures serving Group R-2 occupancies, the annual site energy consumption shall be less than or equal to 61 percent of the annual site energy consumption of the standard reference design.~~ See Section R401.1 and residential building in Section R202 for Group R-2 scope.

Energy use derived from simulation analysis shall be expressed in Btu per square foot of conditioned floor area per year

TABLE R405.3
MAXIMUM ANNUAL SITE ENERGY CONSUMPTION OF PROPOSED DESIGN
RELATIVE TO STANDARD REFERENCE DESIGN

<u>Dwelling Unit Size (ft²)</u>										<u>Group R-2</u>
<u><1,500</u>	<u>1,500-1,749</u>	<u>1,750-1,999</u>	<u>2,000-2,249</u>	<u>2,249-2,499</u>	<u>2,500-2,749</u>	<u>2,750-2,999</u>	<u>3,000-3,249</u>	<u>3,250-3,499</u>	<u>≥3,500</u>	
<u>59%</u>	<u>54%</u>	<u>49%</u>	<u>44%</u>	<u>44%</u>	<u>42%</u>	<u>42%</u>	<u>41%</u>	<u>39%</u>	<u>37%</u>	<u>56%</u>