





# ENERGY STAR Single-Family New Homes

## National Rater Design Review Checklist, Version 3.1 / 3.2 / 3.3 (Rev. 14)

**If pursuing Track B - HVAC Credential, complete this page.**

Home Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Permit Date: \_\_\_\_\_

<b>1. Partnership Status</b>	<b>Must Correct</b>	<b>Rater <sup>2</sup> Verified</b>	<b>N/A <sup>3</sup></b>
1.1 Rater has verified and documented that builder has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/ResPartnerDirectory">www.energystar.gov/ResPartnerDirectory</a> . <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 Rater has verified and documented <sup>12</sup> that HVAC contractor holds credential required to complete National HVAC Commissioning Checklist, unless all equipment to be installed in home to be certified is an exempted type, in which case check "N/A". <sup>13</sup> HVAC Contractor Company Name: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Rater has verified and documented that their company has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/ResPartnerDirectory">www.energystar.gov/ResPartnerDirectory</a> . <sup>5</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.4 Rater(s) signing checklists attest that they have completed EPA-recognized training and are credentialed by a Home Certification Organization (HCO).	<input type="checkbox"/>	<input type="checkbox"/>	-
<b>2. High-Performance Insulation &amp; Fenestration</b>			
2.1 Specified total building thermal envelope achieves the following: <sup>6, 7, 8, 9</sup> For all Versions except those noted below: ≤ 100% of the total UA per 2009 IECC Table 402.1.3 For National Version 3.2: ≤ 100% of the total UA per 2021 IECC Table 402.1.2 For National Version 3.3: In CZ 1-2: ≤ 108% of the total TC per 2024 IECC Table 402.1.2 In CZ 3-8: ≤ 115% of the total TC per 2024 IECC Table 402.1.2	<input type="checkbox"/>	<input type="checkbox"/>	-
2.2 In CZ 1-3, 4A, and 4B, specified windows, skylights, and doors that are ≥ 50% glazed achieve the following: <sup>6, 8</sup> For all Versions except those noted below: Area-weighted average SHGC ≤ 2009 IECC Table 402.1.1 For National Version 3.2: Area-weighted average SHGC ≤ 2021 IECC Table 402.1.2 For National Version 3.3: Area-weighted average SHGC ≤ 2024 IECC Table 402.1.2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3b. Review of ENERGY STAR National HVAC Design Report <sup>14, 15</sup></b>			
3b.1 National HVAC Design Report collected for records, with no applicable Items left blank.	<input type="checkbox"/>	<input type="checkbox"/>	-
3b.2 National HVAC Design Report reviewed by Rater for the following parameters (National HVAC Design Report Item # in parenthesis):			
3b.2.1 Cooling season and heating season outdoor design temperatures used in loads (3.3) are within the limits defined for the State and County, or US Territory, where the home will be built, or the designer has provided an allowance from the EPA to use alternative values. All limits are published at <a href="http://www.energystar.gov/hvacdesigntemps">www.energystar.gov/hvacdesigntemps</a> . Note that revised (i.e., 2019 Edition) limits are required to be used for all HVAC Design Reports generated after 10/01/2020. <sup>16</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.2 Number of occupants used in loads (3.4) is within ± 2 of the home to be certified. <sup>17</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.3 Conditioned floor area used in loads (3.5) is between 100 sq. ft. smaller and 300 sq. ft. larger than the home to be certified. <sup>18</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.4 Window area used in loads (3.6) is between 15 sq. ft. smaller and 60 sq. ft. larger than the home to be certified, or, for homes to be certified with > 500 sq. ft. of window area, between 3% smaller and 12% larger. <sup>19</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.5 Predominant window SHGC used in loads (3.7) is within 0.1 of predominant value in the home to be certified. <sup>20</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.6 Sensible, latent, & total heat gain are documented (3.10 - 3.12) for the orientation of the home to be certified. <sup>21</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.7 The variation in total heat gain across orientations (3.13) is ≤ 6 kBtuh. <sup>21</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3b.2.8 Cooling sizing % (4.13) is within the cooling sizing limit (4.15) selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Additional Construction Document Review – Recommended, but not required</b>			
4.1 Rater has reviewed the reduced thermal bridging details in Section 3 of the National Rater Field Checklist and identified which strategies, if any, are intended to be used in the home to be certified. <sup>9</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date of Review: _____			
Rater Signature: _____ Rater Company Name: _____			



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## Footnotes

1. Track A – HVAC Grading shall use ANSI / RESNET / ACCA / ICC 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO that the home is being certified under.
2. All items shall be verified for each certified home and sampling protocols shall not be used. The term ‘Rater’ refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater or Approved Inspector, as defined by ANSI / RESNET / ICC 301, or an equivalent designation as determined by an HCO; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
3. The column titled “N/A,” which denotes items that are “not applicable,” should be used when the checklist Item is not present in the home or conflicts with local requirements.
4. Raters are only required to document the partnership status of a builder once, for the first home that the Rater certifies for them.
5. Raters are only required to document the partnership status of their company once, for the first home that the Rater certifies for them.
6. For all Versions except National v3.2 and National v3.3, the 2009 IECC Climate Zone designations are applicable, as defined and illustrated in [Section R301](#) of the code. For National v3.2 and National v3.3, the 2021 IECC Climate Zone designations are applicable, as defined and illustrated in [Section R301](#) of the code. Note that some locations have shifted to a different climate zone in the 2021 IECC compared to prior editions.
7. For all Versions except National v3.2 and National v3.3 the total building thermal envelope UA (i.e., accounting for ceilings, walls, floors, slabs, and fenestration) shall be less than or equal to the total UA resulting from multiplying the U-factors in 2009 IECC Table 402.1.3 by the same assembly area as the home to be certified.  
For National v3.2, the total building thermal envelope UA shall be less than or equal to the total UA resulting from multiplying the U-factors in 2021 IECC Table 402.1.2 by the same assembly area as the home to be certified. Exception for homes permitted before 01/01/2025 and certified using National v3.2: the total building thermal envelope UA shall be less than or equal to 105% of the total UA resulting from multiplying the U-factors in 2021 IECC Table 402.1.2 by the same assembly area as the home to be certified.  
For National v3.3, the total building thermal envelope TC shall be less than or equal to 108% in Climate Zone 1-2 and 115% in Climate Zone 3-8 of the total TC resulting from using the factors in 2024 IECC Table R402.1.2 and Equation 4-1 of that code.  
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. The calculation for a steel-frame envelope assembly shall use the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method. In jurisdictions designated by a code official as having Very Heavy Termite Infestation, the total UA or TC limit shall be calculated by replacing the code-required slab insulation R-value and depth with the slab insulation R-value and depth specified in the Rated Home. See exceptions in Footnote 8.
8. If no NFRC rating is noted on the window or in product literature (e.g., for site-built fenestration), select the U-factor and SHGC value from Tables 4 and 10, respectively, in 2013 ASHRAE Fundamentals, Chapter 15. Select the highest U-factor and SHGC value among the values listed for the known window characteristics (e.g., frame type, number of panes, glass color, and presence of low-e coating). Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion. The following exceptions apply:
  - a. 15 sq. ft. of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from the area-weighted averages calculated in Item 2.1 and 2.2;
  - b. One side-hinged opaque door assembly up to 24 sq. ft. in area shall be exempt from the U-factor requirements and shall be excluded from the area-weighted averages calculated in Item 2.1;
  - c. Fenestration utilized as part of a passive solar design shall be exempt from the U-factor and SHGC requirements, and shall be excluded from the area-weighted averages calculated in Item 2.1 and 2.2. Exempt windows shall be facing within 45 degrees of true South and directly coupled to thermal storage mass that has a heat capacity > 20 btu / cu. ft. x °F and provided in a ratio of at least 3 sq. ft. per sq. ft. of South facing fenestration. Generally, thermal mass materials will be at least 2 in. thick.
  - d. In Phius or PHI certified homes, where triple-glazed window assemblies with thermal breaks / spacers between the panes are used, such windows meet the intent of Item 2.1 and 2.2 and shall be excluded from the area-weighted averages calculated.
9. Reduced thermal bridging strategies, while not mandatory, will improve the comfort and efficiency of a home and help meet the ENERGY STAR ERI Target or equivalent performance target, as well as the thermal backstop in Item 2.1. The EPA recommends, but does not require, that builders include selected details on plans to ensure proper implementation during construction.
10. If pursuing Track A, then Item 3a.1 and 3a.2 shall be completed, even if the field verification tasks in ANSI / RESNET / ACCA / ICC 310 are not applicable to any HVAC systems in the home (e.g., a home with a boiler and no AC). Item 3a.3 shall be completed if the home to be certified contains an air conditioner or heat pump; otherwise, ‘N/A’ shall be checked.
11. As an alternative, the ENERGY STAR National HVAC Design Report may be collected in lieu of the ENERGY STAR National HVAC Design Supplement to Std. 310 for Dwellings & Units. In such cases, at least two documents will still be collected – an HVAC design report compliant with ANSI / RESNET / ACCA / ICC 310 plus the ENERGY STAR National HVAC Design Report. Note that for projects with more than one HVAC system, one ENERGY STAR National HVAC Design Report per system would need to be collected.
12. Raters’ documentation of the HVAC contractor credential must be updated at least once every 12 months.
13. HVAC contractors must be credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO) if a split air conditioner, unitary air conditioner, air-source heat pump, or water-source (i.e., geothermal) heat pump up to 65 kBtuh with a forced-air distribution system (i.e., ducts) or a furnace up to 225 kBtuh with a forced-air distribution system (i.e., ducts) will be installed in the home to be certified. For all other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems, a credential is not required. An explanation of this credentialing process and links to H-QUITOs, which maintain lists of credentialed contractors, can be found at [energystar.gov/newhomeshvac](http://energystar.gov/newhomeshvac).



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14. If pursuing Track B, then Section 3b shall be fully completed if the home contains split air conditioners, unitary air conditioners, air-source heat pumps, or water-source (i.e., geothermal) heat pumps up to 65 kBtuh with forced-air distribution systems (i.e., ducts) or furnaces up to 225 kBtuh with forced-air distribution systems (i.e., ducts). For a home without any of these system types, collection of the National HVAC Design Report is still required with Section 1 and 2 completed. However, for such a home the EPA recommends, but does not require, that Sections 3 through 5 of the report be completed and that the report be reviewed per Item 3b.2.
15. The Rater shall collect one National HVAC Design Report per system design per plan. Regardless of whether the “site-specific design” or “group design” box has been checked in Item 1.6 of the National HVAC Design Report, the system design as documented on the National HVAC Design Report must fall within the tolerances in Item 3b.2 for the home to be certified. The report is only required to be collected once per system design, even if multiple homes are built using this design (e.g., in a production environment where the same plan is built multiple times, only one report is required as long as no aspect of the system design changes between homes). The Rater is only responsible for verifying that the designer has not left any items blank on the National HVAC Design Report and for verifying the discrete objective parameters in Item 3b.2 of this Checklist, not for verifying the accuracy of every input on the National HVAC Design Report. Homes certified under Rev. 14 of the program requirements are permitted to use any Revision of the National HVAC Design Report between Rev. 08 and Rev. 14.
16. Visit [www.energystar.gov/hvacdesigntemps](http://www.energystar.gov/hvacdesigntemps) for the maximum cooling season design temperature and minimum heating season design temperature permitted for ENERGY STAR Single-Family New Homes and the process for a designer to obtain an allowance from the EPA. The same design report is permitted to be used in other counties, as long as the design temperature limits in those other counties meet or exceed the cooling and heating season temperature limits for the county selected. For example, if Frederick County, VA, is used for the load calculations, with a 1% cooling temperature limit of 93 °F, then the same report could be used in Fairfax County (which has a higher limit of 94 °F) but not in Albemarle County (which has a lower limit of 92 °F).
17. To determine the number of occupants among all HVAC systems in the home, calculate the number of bedrooms, as defined below, and add one. The number of occupants used in loads must be within  $\pm 2$  of the home to be certified, unless Item 1.5 of the National HVAC Design Report indicates that the system is a cooling system for temporary occupant loads.

A bedroom is defined by ANSI / RESNET / ICC 301-2014 as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A “den”, “library”, or “home office” with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

An egress window, as defined in 2009 IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

  - have a sill height of not more than 44 in. above the floor; AND
  - have a minimum net clear opening of 5.7 sq. ft.; AND
  - have a minimum net clear opening height of 24 in.; AND
  - have a minimum net clear opening width of 20 in.; AND
  - be operational from the inside of the room without the use of keys, tools or special knowledge.
18. Conditioned Floor Area for the home to be certified shall be calculated in accordance with the definition in ANSI / RESNET / ICC 301-2019.
19. Window area for the home to be certified shall be calculated in accordance with the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC 301-2019.
20. “Predominant” is defined as the SHGC value used in the greatest amount of window area in the home.
21. Orientation represents the direction that the front door of the house is facing. The designer is only required to document the loads for the orientation(s) that the house might be built in. For example, if a house plan will only be built one time in a specific orientation (e.g., a site-specific design), then the designer only needs to document the loads for this one orientation.

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