



ENERGY STAR® Qualified Homes, Version 2.5 (Rev. 04) Performance Path Design Requirements Checklist

HOME ID: _____				
Inspection Guidelines	Plant QC	Builder	Rater	N/A
HERS Index				
HERS Index _____ is less than or equal to the ENERGY STAR HERS Index Target ¹ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The conditioned floor area (CFA) is less than or equal to the Benchmark Home ² OR ; The following Size Adjustment Factor (SAF) ³ has been applied: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Envelope, Windows & Doors				
Hot Climates (2009 IECC CZs 1, 2, 3): If more than 10 linear feet of ductwork are located in an unconditioned attic, a radiant barrier or ENERGY STAR qualified roof product shall be installed ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ceiling, wall, floor and slab insulation levels meet or exceed 2009 IECC levels and achieve RESNET-defined Grade I installation or, alternatively, Grade II for surfaces with insulated sheathing (see Thermal Enclosure System Checklist item 4.4.1 for required insulation levels) ^{5,6,7}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All windows, doors and skylights meet or exceed 2009 IECC requirements ⁸	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thermostat & Ductwork				
Programmable thermostat installed (unless thermostat controls a zone with electric radiant heat, for which a manual thermostat is allowed) ⁹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supply ducts in unconditioned attics and other unconditioned spaces have insulation \geq R-6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Duct leakage to outdoors shall be \leq 6 CFM25 per 100 sq. ft. of conditioned floor area ^{10,11}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plant QC Signature: _____	Inspection Date: _____			
Builder Signature: _____	Inspection Date: _____			
Rater Signature: _____	Inspection Date: _____			



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Notes

- For a complete definition of the ENERGY STAR Reference Design to be used when determining the ENERGY STAR HERS Index Target, see the document titled “ENERGY STAR HERS Index Target Procedure, Version 3 (Rev. 04)”.

$$\text{ENERGY STAR HERS Index Target} = \text{HERS Index of ENERGY STAR Reference Design Home} \times \text{SAF}$$

- The average-size home with a specific number of bedrooms is termed the “Benchmark Home”. The conditioned floor area of a Benchmark Home (CFA Benchmark Home) is determined by selecting the appropriate value from Exhibit 3. For homes with more than 8 bedrooms, the CFA Benchmark Home shall be determined by multiplying 600 sq. ft. times the total number of bedrooms and adding 400 sq. ft.

Example: CFA Benchmark Home for a 10 bedroom home = (600 sq. ft. x 10) + 400 sq. ft. = 6,400 sq. ft.

Exhibit 3: Benchmark Home Size

No. of Bedrooms in Home to be Built	1	2	3	4	5	6	7	8
Conditioned Floor Area _{Benchmark Home}	1,000	1,600	2,200	2,800	3,400	4,000	4,600	5,200

A bedroom is defined by RESNET 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 inches 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

Calculate the number of bedrooms and the CFA of the home to be built using RESNET standards with the following exceptions: floor area in basements with at least half of the gross surface area of the basement’s exterior walls below grade shall not be counted. To determine whether at least half of the basement wall area is below grade, use the gross surface area of the walls that are in contact with either the ground or ambient outdoor air, measured from the basement floor to the bottom of the basement ceiling framing (e.g., the bottom of the joists for the floor above). Note that the exception regarding the floor area in basements is only for the purpose of determining a home’s Benchmark Home Size, Size Adjustment Factor, and eligibility to use the Prescriptive Path. The full conditioned floor area, per RESNET’s standards, should be used when rating the home (e.g., determining compliance with duct leakage requirements).

- For all single-family detached homes, townhomes, rowhomes, duplexes, triplexes, and quadplexes calculate the Size Adjustment Factor (SAF) using the following equation:

$$\text{SAF} = [\text{CFA}_{\text{Benchmark Home}} / \text{CFA}_{\text{Home to Be Built}}] 0.25, \text{ not to exceed } 1.0$$

Where:

CFA _{Benchmark Home} = Conditioned Floor Area of the Benchmark Home, using Exhibit 3 above
CFA _{Home to be Built} = Conditioned Floor Area of the Home to be Built

For the purposes of this step, calculate the number of bedrooms and the CFA of the home to be built using RESNET standards with the following exceptions: bedrooms and floor area in basements with at least half of gross surface area of the basement’s exterior walls below grade shall not be counted. If a home has zero bedrooms with regard to the Benchmark Home Size determination, then the Benchmark Home Size for one bedroom shall be used. If the CFA of the home to be built exceeds the CFA of the Benchmark Home, then the Performance Path shall be used. Because the SAF cannot exceed 1.0, it only modifies the HERS Index for homes with conditioned floor area greater than the Benchmark Home. For condos and apartments in multi-family buildings the SAF shall always equal 1.0.

- Any radiant barrier with a minimum initial reflectance of 0.90 and a maximum initial remittance of 0.10 meet the requirement for a radiant barrier. For ENERGY STAR Qualified Roof Product Criteria, see www.energystar.gov/index.cfm?c=roof_prods.pr_crit_roof_products.
- Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC – Table 402.1.1 (see page 4.13). The following exceptions apply:
 - Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24” on center. This exception shall not apply if the alternative calculations in d) are used;
 - For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;



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- c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;

- d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows:

An assembly with a U-factor equal or less than specified in 2009 IECC – Table 402.1.3 complies (see page 4.13).

A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non-fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach. Note that fenestration products (i.e., windows, skylights, doors) shall not be included in this calculation. Also, note that while ceiling and slab insulation can be included in trade-off calculations, the R-value must meet or exceed the minimum values listed in items 4.1 through 4.3 of the Thermal Enclosure System checklist to provide an effective thermal break, regardless of the UA tradeoffs calculated. 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.

6. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.
7. Insulation shall be verified by a Rater to achieve Grade I installation as defined in the RESNET Standards, except for ceiling, wall, and floor assemblies with continuous rigid insulation sheathing. For such homes, Grade II installation is acceptable for the cavity insulation only if the rigid insulation sheathing meets or exceeds the following levels: R-3 in CZs 1 to 4; R-5 in CZs 5 to 8.
8. All windows, doors, and skylights shall meet or exceed the component U-factor and SHGC requirements specified in the 2009 IECC – Table 402.1.1 (see page 4.13). 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 14, respectively, in 2005 ASHRAE Fundamentals, Chapter 31. 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:
- An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
 - An area-weighted average of fenestration products more than 50% glazed shall be permitted to satisfy the SHGC requirements;
 - 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above;
 - One side-hinged opaque door assembly up to 24 square feet in area shall be exempt from the U-factor requirements and shall be excluded from area-weighted averages calculated using a) and b), above;
 - Fenestration utilized as part of a passive solar design shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above. 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/ft³×°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" thick.
9. For homes with heat pumps, the thermostat shall have “Adaptive Recovery” technology to prevent the excessive use of electric backup heating.
10. Duct leakage shall be determined and documented by a Rater using a RESNET-approved testing protocol only after all components of the system have been installed (e.g., air handler and register grilles). Leakage limits shall be assessed on a per-system, rather than per-home, basis. Testing of duct leakage to the outside can be waived if all ducts and air handling equipment are located within the home’s air and thermal barriers AND envelope leakage has been tested to be less than or equal to half of the Prescriptive Path infiltration limit for the Climate Zone where the home is to be built.
11. For all homes that have less than 1,200 sq. ft. of conditioned floor area (CFA), measured duct leakage to outdoors shall be ≤ 5 CFM25 per 100 sq. ft. of CFA.