



# ENERGY STAR Qualified Homes Builder Option Package for Duplex Homes with Concrete Block Walls for US Pacific Islands

The requirements for the ENERGY STAR Builder Option Package (BOP) are specified in the table below.

To qualify as ENERGY STAR using this BOP, a home must meet the requirements specified, be verified and field-tested in accordance with the HERS Standards by a RESNET-accredited Provider, and meet all applicable codes.

<b>Location</b>	<b>Guam, American Samoa, Northern Mariana Islands and Territories of US Minor Islands</b>
<b>Building Type</b>	For use only with duplex slab-on-grade housing with concrete block walls with less than 1800 SF in total conditioned floor area.
<b>Cooling Equipment</b>	Right-sized <sup>1</sup> ≥13 SEER Air Conditioner or Heat Pump
<b>Heating Equipment</b>	Any heating system is allowed
<b>Thermostat</b>	ENERGY STAR Qualified Thermostat is recommended, but not required
<b>Ductwork</b> <sup>2</sup>	100% of ducts to be located in conditioned space (inside the air and thermal barrier)
<b>Envelope</b>	≤ 6 ACH50      Infiltration <sup>3,4</sup>
	≤ Reference UA      UA Alternative Approach <sup>5</sup> ; <u>OR</u> , ≥ 19 R-Value      Ceiling Insulation <sup>5</sup> ; <u>AND</u> (if applicable), ≥ 19 R-Value      Cathedral Ceiling Insulation <sup>5</sup> ; <u>AND</u> , ≥ 10 R-Value      Insulation on Concrete Block Wall <sup>5</sup> ; <u>AND</u> , <u>None</u> <u>Slab Insulation; AND</u> .
	Completed Thermal Bypass Inspection Checklist <sup>6</sup>
<b>Windows</b> <sup>7</sup>	≤ 1.10 U-Value ≤ 0.55 SHGC Window Area ≤ 12% of Total Conditioned Floor Area
<b>Water Heater</b> <sup>8</sup>	Gas (EF):    40 Gal ≥ 0.61         50 Gal ≥ 0.59         60 Gal ≥ 0.57         80 Gal ≥ 0.53 Electric (EF): 40 Gal ≥ 0.93         50 Gal ≥ 0.92         60 Gal ≥ 0.91         80 Gal ≥ 0.89
<b>Lighting and Appliances</b> <sup>9,10</sup>	ENERGY STAR Qualified Refrigerator(if installed); <u>AND</u> , ENERGY STAR Qualified Dishwasher(if installed); <u>AND</u> , ENERGY STAR Qualified Clothes washer (if installed); <u>AND</u> , 75% or more ENERGY STAR light fixtures, ENERGY STAR ceiling fans equipped with lighting fixtures, ENERGY STAR ventilation fans and/or ENERGY STAR CFL Bulbs.



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1. Cooling equipment shall be sized according to the latest editions of ACCA Manuals J and S, ASHRAE Handbook of Fundamentals, or an equivalent procedure. Maximum oversizing limit for air conditioners and heat pumps is 15%. The following operating conditions shall be used in the sizing calculations and verified where reviewed by the rater:  

Outdoor temperatures shall be the 99.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available. Note that a higher outdoor air design temperature may be used if it represents prevailing local practice by the HVAC industry and reflects extreme climate conditions that can be documented with recorded weather data; Indoor temperatures shall be 75 F for cooling; Infiltration rate shall be selected as "tight", or the equivalent term.

In specifying equipment, the next available size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI standards.
2. To prevent condensation, using a minimum of R-4 insulation for ducts inside conditioned space is recommended, but not required.
3. Envelope leakage must be determined by a RESNET-certified rater using a RESNET-approved testing protocol.
4. To ensure consistent exchange of indoor air, whole-house mechanical ventilation is recommended, but not required.
5. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade I installation as defined in the RESNET Standards by a RESNET-certified rater.  

Note that the fenestration requirements of the 2004 IRC do not apply to the fenestration requirements of this Builder Option Package. Therefore, if UA calculations are performed, they must use the IRC requirements (with the exception of fenestration) plus the fenestration requirements contained in the national BOP. For more information, refer to the "Codes and Standards Information" document.
6. The Thermal Bypass Inspection Checklist must be completed for homes to earn the ENERGY STAR label. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete.
7. Up to 0.75% WFA may be used for decorative glass that does not meet ENERGY STAR requirements. For example, a home with total above-grade conditioned floor area of 2,000 sq. ft. may have up to 15 sq. ft. (0.75% of 2,000) of decorative glass.
8. To determine domestic hot water (DHW) EF requirements for additional tank sizes, use the following equations:  
$$\text{Gas DHW EF} \geq 0.69 - (0.002 \times \text{Tank Gallon Capacity}); \text{Electric DHW EF} \geq 0.97 - (0.001 \times \text{Tank Gallon Capacity}).$$
9. ENERGY STAR qualified ventilation fans include range hood, bathroom, and inline fans. ENERGY STAR qualified lighting fixtures installed in the following locations shall not be counted: storage rooms (e.g., closets, pantries, sheds), or garages. Eligible appliances include ENERGY STAR qualified refrigerators, dish washers, and washing machines. Further efficiency and savings can be achieved by installing ENERGY STAR qualified products, in addition to those required (e.g., additional lighting, appliances, etc.).
10. Efficient lighting fixtures represent a significant opportunity for persistent energy savings and a meaningful way to differentiate ENERGY STAR qualified homes from those meeting minimum code requirements. In 2008, EPA intends to propose and solicit industry comments on adding the ENERGY STAR Advanced Lighting Package (ALP) as an additional requirement for ENERGY STAR qualified homes in 2009. To learn more about the ALP, refer to [www.energystar.gov/homes](http://www.energystar.gov/homes).