

ENERGY EFFICIENT HOUSING APPLICATION GUIDELINES

This program is made available as an effort to promote homes that incorporate innovative measures which use the most efficient components in the building envelope and Heating Ventilating & Air Conditioning (HVAC) system. For that reason the Home Energy Rating System (HERS) ratings are required to use code defaults which set the infiltration levels of the HERS reference home and the designed home at equal levels. This results in a HERS score that is a reflection of the efficiency of the building design, as opposed to a score that is a result of low infiltration rates. To be eligible for the program, a home must achieve a HERS score of 50 or less.

1. To complete a successful application, without delays caused by discrepancies between documents and delays from required revisions, all parties, the design professional, Home Energy Rater (HERS rater), and HVAC contractor will need to work together. If the HERS rater or HVAC contractor require information which is not on the drawings, then that information will need to be added to the drawings prior to submittal to avoid a re-submittal and further review.
2. The following notes may **NOT** be used as a blanket to supersede different efficiencies called out on or in submitted plans and/or specifications. Submitted plans and specifications must be specific to the home being reviewed, must be complete, must be dated, must be numbered, must contain revision blocks when revisions are made after the initial submittal, and must use standard drafting practices, i.e. notes scribbled by hand and copies on copies will not be accepted or reviewed.
3. To ensure a speedy review of submitted plans and reports, R-values, U-values, and other efficiencies must be consistent throughout the plans and specifications. HERS reports and possible Manual J calculations must reflect the home shown on the plans. Any differences or inaccuracies found in these documents during the review will require revision and re-submittal.
4. The notes provided below are not “all encompassing” and are intended only as an aid to inform the designer of information required to complete a HERS rating. Some notes may not apply to a specific home or may need to be adjusted, while others are required by code or by this program.
5. To ensure the builder is aware of any missing information, provide a numbering system for all plan pages, such as using the convention 1 of X, 2 of X, 3 of X, where X is the total number of pages, or by providing a drawing index on each page showing the total number of drawings.
6. If a separate set of building specifications are included in addition to the plans, then the plans must contain a clearly visible note on the first page indicating that a separate set of specifications also apply, and in keeping with note 5 above, specifications must be named and numbered consistent with the plans. Note that there can be no discrepancies between information in the specifications and information on the plans. Notes in the specifications do not replace plan notes. The plans are the defining document and must contain all necessary notes and dimensions to complete a HERS rating, and a Manual J calculation, regardless of whether or not a separate set of specifications exist.
8. Plans submitted for review must be the final home design and may not be marked as “preliminary” or “not for construction.” Submitted plans must be full size, easily readable, and an honest representation of how the home will be built.
9. DO NOT include a copy of these guidelines with the application.

TYPICAL PLAN NOTES:

Exterior joints, seams or penetrations in the building envelope, that are sources of air leakage, shall be sealed with durable caulking materials, sealed with gasketing systems, taped or covered with moisture vapor-permeable housewrap. **(required note)**

Install insulation depth markers in attic areas to ensure proper insulation depth, one marker for every 300 square feet, with markers dispersed evenly and facing attic opening. **(required note)**

Total cumulative cooling capacity shall not exceed (115% if A/C, 125% if heat pump) of the calculated peak cooling load. Calculated peak cooling load ___ btuh X (1.15 or 1.25) = ___ btuh *MAXIMUM* cooling equipment capacity. (A/C or Heat Pump) unit(s) shall have an AHRI SEER rating of ___ or higher, and an AHRI HSPF of ___ or higher. This sizing calculation is an oversized estimate which represents a maximum, and does not remove the liability of the HVAC contractor to properly size the HVAC equipment according to State Energy Code and Energy Star requirements. **(required note)**

Total cumulative heating capacity shall not exceed 140% of the calculated peak heating load. Calculated peak heating load ___ btuh X 1.4 = ___ btuh *MAXIMUM* heating equipment capacity. Gas Furnace shall have a GAMA rated AFUE of ___% or higher. This sizing calculation is an oversized estimate which represents a maximum, and does not remove the liability of the HVAC contractor to properly size the HVAC equipment according to State Energy Code and Energy Star requirements. **(required note)**

Ductwork shall be properly sized for the required air flow, to include proper reductions along the trunk lines and fabric isolation joints at the connection to the HVAC equipment. **(required note)**

All duct joints, including drives and cleats and adjusting seams, shall be sealed with tape and/or mastic. Tape and/or mastic shall be UL-181 A or B rated for duct sealing. UL-181 rated tape shall have the 'UL-181' shown on the face of the tape. Blank face Foil and Duct tape are NOT acceptable. Duct leakage shall not exceed 3 cfm to the outdoors, and shall not exceed 9 cfm total leakage per 100 square foot of conditioned floor space as tested by a Certified HERS rater. **(required note)**

Ductwork in attic areas shall have a minimum R-value of ____.

Ductwork in exterior wall cavities shall have a minimum R-value of ____.

Indicate on the plans where ductwork will be located, i.e. "All ductwork shall be located within the conditioned space." or "Second floor supply and return ductwork will be located in the attic, all other ductwork will be located within the conditioned space." **(a note of this type is required)**

Hot water heater shall be (gas or electric), and have a minimum GAMA rated EF of 0.____ or higher.

TYPICAL PLAN NOTES (cont'd):

(HRV or ERV) shall have an HVI Total Efficiency rating of ___ or higher, and a Sensible Efficiency rating of ___ or higher.

Slab floors shall have R-___ minimum perimeter insulation, extending to a depth of ___ inches below grade, and ___ inches horizontally from the perimeter edge.

Walls shall be (2x4 or 2x6) on (16 or 24) inch centers with a minimum R-___ cavity insulation.

Knee walls shall be (2x4 or 2x6) on (16 or 24) inch centers with a minimum R-___ cavity insulation.

Rim and band joist areas shall be insulated with a minimum R-___.

Vaulted Ceiling shall not exceed ___ square feet of area, and shall have a minimum R-___ insulation.

Ceilings exposed to attic areas shall have a minimum R-___ insulation.

Windows shall have an NFRC tested U-value not to exceed 0.____, and a Solar Heat Gain Coefficient (SHGC) not to exceed 0.____. -- As an alternative to this and following window/door notes provide NFRC U-value, NFRC SHGC, & R.O. dimensions on window/door schedule – **schedule is preferred.**

Exterior Glass Doors shall have an NFRC tested U-value not to exceed 0.____, and a Solar Heat Gain Coefficient (SHGC) not to exceed 0.____.

Window & Door rough opening dimensions must be included on the plans.

Exterior Solid Core Doors shall have an NFRC tested U-value not to exceed 0.____.

The direction the home will face must be denoted on the plans.

No less than ___% of all lighting fixtures shall be pin based fluorescents.

No less than ___% of all lighting fixtures shall be equipped with compact fluorescent bulbs. This ___% can be reduced by an equal percentage of pin based fluorescents exceeding the ___% requirement for pin based.

Section views must be specific to the home being built. The designer must provide a section view which shows the contractor how each type of insulation should be installed. This is particularly important for slab edge and foundation insulations, and insulation on the top of, and sides of, coffered or stepped ceilings, showing how the insulation will be contained or supported to maintain full depth over the edge of the ceilings. **(section views of this type are required)**

HERS REPORTS:

1. The plans are the defining document and must contain all necessary notes and dimensions to complete a HERS rating, regardless of whether or not a separate set of specifications exist.

If the HERS rater needs to contact the building contractor or design professional for information not on the plans, then that information must be added to the plans. The rater should advise the person responsible for the plans of the lack of information, instructing them to add the information. **To be eligible, a home must achieve a HERS score of 50 or below.**

2. Duct leakage should be input as “Proposed Reduced Leakage.” Input Whole House Infiltration as “Code Default” for the Measurement Type and “Natural ACH” set at the values below. Use “Tested” for the Verification Method.

Natural ACH, Based on Floor Area:

900 square feet or less=====> use Heating Natural ACH 0.41, Cooling Natural ACH 0.22
901 to 1500 square feet =====> use Heating Natural ACH 0.31, Cooling Natural ACH 0.16
1501 to 2000 square feet =====> use Heating Natural ACH 0.26, Cooling Natural ACH 0.14
2001 to 3000 square feet =====> use Heating Natural ACH 0.22, Cooling Natural ACH 0.11
3001 square feet and above =====> use Heating Natural ACH 0.19, Cooling Natural ACH 0.10

3. The Natural ACH method above is equivalent to Manual J “Semi-Tight” and is close to the minimum allowed by the IECC. Natural ACH/Semi-Tight represents fairly liberal infiltration. Any mechanical ventilation must be set no higher than the cfm rate in the HERS “Air Leakage Report”. Show HVI ratings for Sensible and Total Efficiency for heat or energy recovery equipment.

4. If the customer or contractor has selected a certain Cfm 50 target they wish to achieve, then calculations for ventilation & equipment for that infiltration rate should be done outside the application. Note that the State Energy Code requires that the HVAC system may not be oversized. **Use of the code default for the purposes of this program does not remove the liability to properly size the HVAC equipment according to State Energy Code and Energy Star requirements.**

5. Be reminded that HERS require that dimensions used be within 1 inch or 1/10th of a foot, but that is for measurements on an existing home. Use exact plan dimensions, be precise and detailed. Do not take shortcuts. **Make sure the latest version of REM/Rate is being used.**

6. Notes on the plans may use terms like “not to exceed” or “minimum” or “less than.” Those phrases are only used as an aid to the builder, giving them a range of products or materials. The phrases do not apply to the HERS reports which must model the home as it is laid out on the plans. If the plans call out a SEER rating of “not less than 17,” then the HERS rating must use 17.

7. Name rating inputs similar to conventions used on the plans. If the plans show windows with labels A, C, and two F’s on the east side of the home with the same depth and overhang, then name that group of windows “East A C 2F.” Descriptive titles will help to speed the review process.

MANUAL J CALCULATIONS:

1. Manual J calculations are *NOT* required for this program. Sizing can be based off of the HERS Equipment Sizing Summary for peak heating and cooling loads. **Use of the HERS Equipment Sizing Summary for the purposes of this program does not remove the liability to properly size the HVAC equipment according to State Energy Code and Energy Star requirements.**
2. If Manual J calculations are submitted, the contractor will need to provide copies of Manual J reports that not only show the calculated peak cooling and heating load, but also show the contractors inputs. “Short” forms by themselves are not sufficient.
3. Manual J calculations must be based off of Version 8 (MJ8) or later, and must comply with all of the “Do’s and Don’ts” outlined in Manual J. Use accurate dimensioning. To ensure a quick and speedy review, be precise, detailed, and **TAKE NO SHORTCUTS. SIZE ACCORDING TO THE CALCULATIONS, as opposed to calculating according to some desired size. The latter is tell-tale and will result in extended reviews due to re-submittals.**
5. Windows and doors must be input as NFRC rated when NFRC ratings are listed on the plans.
6. The equipment Sensible Heat Ratio (SHR) used in a Manual J calculation must match the calculated load within the manufacturer’s limits for SHR. That is to say that using a higher or lower SHR in the calculations is not an excuse to oversize equipment. The SHR is an adjustable feature of all cooling equipment and is adjusted by varying the air flow across the coil (see ACCA Manual S).
7. The contractor is responsible for entering data into the load sizing program which matches the equipment, materials, dimensions, etc. called out on the plans. Load calculations with data that does not match the building plans, or those that do not use Manual J default values for design parameters such as indoor and outdoor temps, number of people, miscellaneous loads, etc., will need to be revised and will delay the review process.
8. While notes on the plans may use terms like “not to exceed” or “minimum” or “less than,” those phrases are only to be used as an aid to the builder, giving them a range of products, as opposed to a specific product. The phrases do not apply to the Manual J calculations which must model the home as it is laid out on the plans. That is to say that if the plans call out a SEER rating of “not less than 17,” then the HVAC contractor must use 17.
9. If the HVAC contractor needs to contact the building contractor or design professional for information not available on the plans, the HVAC contractor should advise the person responsible for the plans of that lack of information and inform that person the plans will need to be revised to include the information. **The plans are the defining document and must contain all necessary notes and dimensions to complete a Manual J load calculation, regardless of whether or not a separate set of specifications exist.**