also assumed to have the same type of HVAC system, e.g., forced air or hot water, as the rated home, except that in the case of homes heated electrically, the reference home is assumed to be heated with an air source heat pump. The Department considers this to be consistent with the use of the minimum equipment efficiency established by NAECA, but acknowledges the fact that in some homes with an extremely efficient envelope, the use of resistance heat might very well represent the best value when life-cycle costing principals are applied. However, it is considered a greater risk to allow the combined inefficiency of a poor envelope using resistance heat to be mitigated if a heat pump system is not specified in the reference home.

Proposed paragraph (a)(13) provides for standard adjustments to HVAC systems for duct or piping losses when the rated home has all or part of its distribution system outside of the conditioned space. The adjustment factors are consistent with those found in the 1994 Amendments to CABO–MEC.

Proposed paragraph (a)(14) provides specifications for water heater efficiency expressed as an energy factor (EF). The values specified are those found in the NAECA requirements for domestic water heaters.

The seasonal average air leakage rate of 0.67 air changes per hour (ACH) established for the reference house in proposed paragraph (a)(15) is consistent with the 1994 amendments to CABO–MEC. Consideration was given to reducing that value to 0.50 air changes per hour as was done in the 1995 edition of CABO–MEC, but at 0.67 there can be a greater incentive to test with diagnostic equipment such as a blower door. With the reference home set at the lower level of 0.50, a tested home would receive minimal credit (0.15 ACH) in the rating before reaching the current ASHRAE minimum of 0.35 ACH assumed necessary for adequate ventilation. With an 0.67 rate as the basis for the reference home, a tested home has the opportunity to demonstrate a 0.32 ACH advantage in the rating. The minimum standard default value in proposed section 437.104, unless diagnostic testing is conducted, is 0.67 so in no case could a rated house claim any advantage over the reference home without testing.

Proposed paragraph (a)(16) sets standard assumptions for the building mass found in the reference building that would be considered when evaluating the benefits of mass for heat storage during both heating and cooling seasons. This approach allows designers of the rated home to incorporate passive solar strategies into the design and to receive full credit for mass provided for that purpose. The internal and structural mass values used are those found in the 1994 Amendments to CABO–MEC.

The reference home defined by proposed section 437.103 represents a fixed rating point that will not change over time. Homes which have been rated will never need to be re-rated unless modifications have been made to the home which affect its energy efficiency.

The Department invites comments on the configuration of the reference house but reminds comment writers that it is not the intention of these guidelines to use the reference house to set any specific level of efficiency. While the specifications happen to be consistent with some current energy efficient mortgage programs, anyone offering incentives for energy efficiency in financing or otherwise, is free to select any point on the rating scale as their ''threshold of energy efficiency'' or other basis for comparison. The objective in defining and using the reference home is consistency and the fact that it is fixed in time has no bearing on future definitions of ''energy efficiency'' or future qualifications for energy efficient financing programs.

Proposed Section 437.104: Minimum Rated Features

Proposed § 437.104 provides in Table 5, a list of building components and a corresponding list of features of those building components that must be considered when calculating the energy consumption for the rated home as required by § 437.100. The Department recognizes that there are numerous additional features or devices that might affect energy consumption in buildings. Examples are ceiling fans, whole house fans, moveable insulation, etc., most of which are occupant controlled. The Department believes that those listed in Table 5 represent all the major influences on energy consumption and that it is not necessary to require that each HERS provider be able to evaluate all options and to do so would place an undue burden on many existing systems. Paragraph (h) of this section states that any HERS provider may base a rating on additional features if the energy analysis tool being used is capable of doing so.

Proposed paragraph (c) provides methods, listed in the preferred order of use, to determine building envelope thermal characteristics.

Proposed paragraph (d) allows for the use of default values when data for the minimum rated features is not available without expensive and destructive disassembly of the home. The Department believes that these default values are best determined by a person or persons knowledgeable about typical construction practices used in any given time frame for homes in any given area. For this reason, this section places the responsibility for establishing or approving default values on the accrediting body and reflects the expectation that the required expertise is present in that body.

Paragraph (e) of this section deals specifically with air leakage. It states that if diagnostic testing equipment is not used to determine leakage, then based on observations of the general tightness of construction, a value of 0.67 air changes per hour or greater is to be used. This precludes the use of a lower, more efficient value in a rated home than is used for the reference home unless testing is done. It does not ensure that the energy consumption attributable to air leakage is accurately reported in the rating but neither do the models used to extrapolate annual average air leakage rates from a single diagnostic test. An experienced and well trained rater may make reasonable estimates of air leakage and doing so without the expense of diagnostic equipment reduces the cost of completing a rating. The Department invites comments on the sensitivity of the possible range of error which can occur with either estimated air leakage or in the models for diagnostic testing.

Proposed paragraph (f) of this section provides methods, listed in a preferred order of use, for determining efficiencies of primary types of mechanical equipment. Proposed paragraph (g) provides as the last in order of preference, an age-based table of default values for typical space conditioning and domestic water heating equipment. A non-aged based table of default values is provided for less common types of mechanical equipment.

These tables identified as Tables 6 and 7, were developed from the following references:

Department of Energy Residential Conservation Services Training Manual (1981)

California Home Energy Efficiency Rating System (CHEERS) equipment default table

Air Conditioning & Refrigeration Institute (ARI) historic equipment shipment data, weighted averages

Gas Appliance Manufacturers Association (GAMA) historic equipment shipment data, weighted averages