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8 Performance Method

8.1 Overview

This chapter explains the performance method of complying with the *2019 Building Energy Efficiency Standards* (Energy Standards). The method works by calculating an Energy Design Rating (EDR). The EDR is a score from 0 to 100, where 0 represents a building that has zero net energy consumption based on the time-dependent valuation ((TDV) energy consumption and 100 represents a building that is minimally compliant with the 2006 International Energy Conservation Code. This is the same criteria for a score of 100 for the National Home Energy Rating System (NatHERS). Approved programs calculate an EDR for the building (proposed efficiency) and compare it to the energy budget (standard efficiency). Approved compliance programs also calculate an EDR for proposed photovoltaic (PV)/demand flexibility and compare it to standard PV/flexibility budget.

The standard efficiency includes water heating, space heating, space cooling, indoor air quality (IAQ) fan energy, and solar generation. Energy use from lighting, kitchen appliances, and washers/dryers is not eligible to be traded off.

The Energy Commission approved computer programs for compliance calculate space-conditioning and water-heating energy use in accordance with a set of rules. Modeling capabilities are in the *2019 Residential ACM Reference Manual* (ACM Reference Manual). All software programs use the same compliance generation tool (California simulation engine [CSE]) to simulate the energy use, and the same report generator to create the certificate of compliance (CF1R), as the public domain program CBECC-Res. Vendors of approved software have the flexibility to create their own user interface, user documentation, and additional forms.

This method provides maximum flexibility to trade off the energy performance of different building components to achieve compliance. Making a building more efficient will lower utility bills and improve comfort.

The performance method is the most popular compliance method allowing builders the flexibility to optimize performance at the lowest cost. Each approved program is required to have a compliance supplement with information on the use of the software as specified in the *2019 ACM Approval Manual*.

A discussion of the performance method with additions and alterations is in Chapter 9.

8.2 What's New for 2019

8.2.1 Determining Compliance – Energy Design Rating (EDR)

The EDR has three components: 1. efficiency EDR, 2. PV/flexibility EDR, and 3. total EDR (also called final EDR). The efficiency EDR is based on the energy efficiency features of the building, including the envelope, HVAC, and hot water-heating features. The PV/flexibility EDR score captures the PV system, battery storage system, precooling strategy, and other demand responsive measures. The total EDR combines the efficiency EDR and PV/Flexibility EDR into a final score. The approved programs do not allow installing more PVs in exchange for less efficiency. However, if PVs are coupled with a battery storage system, a modest credit known as the self-utilization credit is available for tradeoff against the efficiency features. Approved compliance programs allow installing more energy efficiency in exchange for a smaller PV system.

Compliance requires meeting two different criteria:

- Proposed efficiency EDR must be equal or less than standard efficiency EDR, and
- Total EDR (efficiency, PV, battery storage) must be equal or less than total standard EDR.

The efficiency EDR is the building's efficiency without any solar generation. The total EDR includes solar generation and any battery storage. This means the building must be energy efficient and it must generate enough energy to offset the electricity used to operate the building.

8.2.2 Major Changes Affecting Standard Efficiency

The standard design efficiency is based on prescriptive requirements. Two major changes to the standards are quality insulation installation (QII) and solar generation. Although not mandatory, performance compliance will be much more difficult to achieve without QII.

More information about the prescriptive solar electric generation Chapter 7 of this manual or the ACM Reference Manual.

8.2.3 New HERS Verification Requirements

Heat pumps will require verification of their capacity. Because the capacity affects the use of electric resistance back-up heating, a HERS Rater will verify the installed capacity meets or exceeds the capacities modeled for compliance. Software users can either enter the heat pump capacities (at both 47 and 17 degrees) or use an automatic sizing function. (Reference Appendix RA3.4.4.2.)

Whole house fans provide a significant compliance benefit in some climate zones. Software users will have three options, two of which require HERS Rater verification of airflow and watt draw: (1) specify a fan airflow, (2) select the default fan airflow required for prescriptive compliance with HERS verification, or (3) select the default fan airflow without HERS verification (the effectiveness of the whole house fan is derated by 7 percent). When verification is required, a HERS Rater will verify the watt draw and airflow rate. (Reference Appendix RA3.9.)

8.3 Compliance Basics

8.3.1 Compliance Process

Any approved computer program may be used to comply with the Energy Standards using the performance method. The following steps are an outline of the typical computer program procedure:

1. Collect all necessary data on each component.
   a. For the building envelope, the area of each fenestration, wall, door, roof, ceiling and floor is needed. For each component, the applicable energy characteristics needs to be defined including U-factor, solar heat gain coefficients (SHGC), solar reflectance, and thermal mass values.
   b. For HVAC systems, the type and efficiency of space conditioning equipment are required. For hydronic space heating, the specific water heater type and efficiency are required. For fan-forced conditioning systems, the location and amount of insulation of the duct system are needed.
   c. For domestic hot water systems, the water heater type, quantity, efficiency, and area served will be required, along with the water-heating distribution system. Additional information will be required for features such as solar thermal systems and drain water heat recovery devices. More information is in Chapter 5.
   d. For PV systems, the proposed size, and installation location information such as roof slope and orientation of the PV system are needed. Battery storage capacity and control information must be described if battery storage is proposed. Refer to Chapter 7 for more information.

   Other efficiency measures and options can be used to improve building efficiency.
2. Enter the building envelope basic data such as square footage, number of stories, occupancy type, and climate zone. Define each opaque surface with the related orientation, area, and thermal performance properties. Add the fenestration associated with each opaque surface, including any fixed shading such as overhangs and side fins. Enter the data of the equipment and distribution systems for the space conditioning and water-heating systems. The input values and assumptions must correspond to the information on the final approved plan set and inputs must be equal to or more energy efficient than required mandatory measures.
3. Launch a computer simulation to calculate the efficiency EDR and total EDR of the standard design and the proposed design.

For additions and alterations, compliance is based on the TDV energy, and not the EDR criteria for newly constructed buildings. In existing buildings, where the values of installed features are unknown, default values may be used based on the year of the construction. Refer to Table 8-1, Default Assumption for Year Built, at the end of this chapter.

The building energy efficiency complies if all mandatory measures are met and the total TDV energy use of the proposed design is the same as or less than the standard design TDV energy budget.

When creating a computer input file, use the space provided for the project title information to concisely describe the building being modeled. User-designated names should be clear and internally consistent with other orientations and/or buildings being analyzed. Title names and explanatory comments should assist in the compliance and enforcement processes.

8.3.2 Defining the Standard Efficiency

Approved compliance software programs automatically calculate the standard efficiency based on data entered for the proposed building.

The computer program defines the standard building by modifying the geometry of the proposed building and inserting the features of Table 150.1-A (single family) or Table 150.1-B (multifamily) of the Energy Standards. Details are in the *2019 Residential ACM Reference Manual*.

Note the details of how the standard efficiency is determined. Deviations from the prescriptive requirements will be reflected in the compliance margin. For example, if the prescriptive requirements from Table 150.1-A or 150.1-B include roof deck insulation in Option B for the applicable climate zone, and the proposed building is modeled without roof deck insulation, it will significantly affect the attic temperature and result in a compliance penalty. (In prescriptive compliance, a roof with no roof deck insulation would require ducts inside the conditioned space.) In 2019, the standard efficiency includes QII and solar generated electricity. Compliance will be much more difficult to achieve if either of these is not included in the proposed efficiency.

The standard design assumes the same total conditioned floor area and volume as the proposed design and the same gross exterior wall area as the proposed design except that the wall area in each of the four cardinal orientations is divided equally. The standard design uses the same roof/ceiling area, raised floor area, slab-on-grade area, and perimeter as the proposed design but uses the standard insulation R-values required in Table 150.1-A or 150.1-B of the Energy Standards.

The standard design includes all features of the prescriptive compliance tables, including QII, walls with the prescriptive U-factor, roofs with below deck insulation in many climate zones or radiant barrier in other climate zones, and a solar PV system.

Total fenestration area in the standard is equal to the proposed if the fenestration area in the proposed design is less than or equal to 20 percent of the floor area, Otherwise, the fenestration area is equal to 20 percent of the floor area. Fenestration area in the standard is evenly distributed among the four cardinal orientations. SHGC and U-factors are the same as those listed in the prescriptive tables with no overhangs.

The standard design includes minimum efficiency heating and cooling equipment, as well as the minimum duct R-value required for Option B from Table 150.1-A or 150.1-B of the Energy Standards. Ducts are assumed to be sealed as required by

§150.0(m). The standard design also assumes correct refrigerant charge as required by §150.1(c)7A**.**

For water-heating systems that serve dwelling units, the standard design is an instantaneous gas storage water heater with an energy factor equal to the federal minimum standard. The distribution system meets all mandatory requirements specified in §150.0.

For multifamily buildings, when central water heating is proposed, the standard design is based on §150.1(c)8B, which includes details about the recirculation system and a minimum solar fraction that varies by climate zone. See the ACM Reference Manual for more information.

8.3.2.1 Standard Reports

For consistency and ease of enforcement, the manner in which building features are reported by compliance software programs is standardized. Energy Commission-approved compliance software programs produces compliance reports in a standard format. The principal report is the certificate of compliance (CF1R-PRF-01-E).

The CF1R-PRF-01 includes two sections, one for special features and modeling assumptions, and a second requires field verification and/or diagnostic testing by approved HERS Raters. These sections provide a general overview during compliance verification by the local enforcement agency and the HERS Rater. Items in the special features and modeling assumptions section indicate that if such features or assumptions used for compliance are not installed, the building would be noncompliant, and they call for special care by the local enforcement agency. Items in the HERS required verification section rely on diagnostic testing and independent verification by an approved HERS Rater to ensure proper field installation. Diagnostic testing and verification by HERS Raters is in addition to local enforcement agency inspections.

8.3.3 Professional Judgment

Some modeling techniques and compliance assumptions applied to the proposed design are fixed or restricted. At other times, professional judgment may be acceptable or necessary.

Enforcement agencies can reject a particular input if the permit applicant cannot substantiate the value with supporting documentation or cannot demonstrate that appropriate professional judgment was applied.

Two questions can resolve whether professional judgment was applied correctly:

- Is a simplified input or assumption appropriate and conservative? If simplification increases the predicted energy use of the proposed building or reduces the compliance margin when compared to a more explicit and detailed modeling assumption, the simplification is acceptable. Simplification must reflect a worse case than a more detailed model and result in the same or lower compliance margin.

- Is the approach or assumption consistent with what is used by the compliance software to generate the standard design?

Any unusual modeling approach, assumption, or input value should be documented with published data and conform to standard engineering practice.

Call the Energy Hotline or contact the compliance software vendor for help in evaluating the appropriateness of input assumptions.

Example 8-1

Question

Three different-sized windows in the same wall of a new home are designed without exterior shading. They have the same National Fenestration Rating Council (NFRC) rated U-factors and SHGC values. Is it acceptable professional judgment to simplify the computer model by adding the areas of the windows and inputting them as a single fenestration area?

Answer

No. Although the compliance software will produce the same results whether the windows are modeled individually or together as one area, plan checking or finding errors when windows are combined is much more difficult. If the software has a multiplier, identical window sizes with identical shading features can be combined. Otherwise each window is modeled individually.

8.4 Mixed-Occupancy Buildings

§100.0(f)

Some residential buildings have areas of other occupancies, such as retail or office, in the same building. An example is a three-story building with two floors of apartments above ground-floor shops and offices. Consider the number of habitable stories in the building. If there are four or more stories, high-rise residential standards apply to any residential occupancies.

Depending on the area of the different occupancies, energy compliance may be demonstrated as if the whole building is residential for the space-conditioning and water-heating requirements. This is allowed if the residential occupancy accounts for at least 80 percent of the conditioned floor area of the building (or permitted space). Lighting compliance must be based on the requirements for each occupancy type.

Note: Mandatory measures apply separately to each occupancy type regardless of the compliance approach used. The residential envelope is subject to §150.0, while the nonresidential envelope is subject to §120.7.

If complying under the mixed-occupancy exception, residential and nonresidential documentation for mandatory measures must be submitted with other compliance documentation.

If the building design does not fit the criteria for a dominant occupancy, then the low-rise residential occupancy type must be shown to comply by itself. The remaining occupancy types must be shown to comply separately either by independent compliance for each occupancy or for the nonresidential performance approach by combining nonresidential occupancies in accordance with the *Nonresidential ACM Reference Manual*. This may be done by using any approved prescriptive or performance methods available for each occupancy type. Documentation for each occupancy type must also be considered separately, and a certificate of compliance must be submitted for each occupancy type. Mixed high-rise and low-rise residential occupancies will not occur in the same building because the designation applies to the building.

8.5 Buildings With Multiple Dwelling Units

There are three classifications of multiple dwelling unit buildings:

- Buildings with two dwelling units (duplexes): Each dwelling unit is modeled as an individual single family building.
- Buildings consisting of townhouse style dwelling units. These have no common ceilings or floors between dwelling units. Each dwelling unit is modeled as an individual single family building.
- Buildings consisting of three or more dwelling units that are not townhouses (R-2 occupancy group). Model as a multifamily building.

8.6 Multifamily Buildings

§100.1(b)

Envelope, HVAC equipment, and outdoor lighting requirements for high-rise multifamily buildings (four or more habitable stories) are covered by the *Nonresidential Energy Standards*. These requirements are in the *Nonresidential Compliance Manual.* Indoor lighting in dwelling units and water-heating requirements for high-rise multifamily buildings are covered under the *Residential Energy Standards* and this manual.

Low-rise multifamily buildings (occupancy group R-1 or R-2) that are one to three habitable stories are covered by the *Residential Energy Standards* and this manual. Compliance for a low-rise multifamily building may be demonstrated either for the building as a whole or on a unit-by-unit basis. Rental apartment buildings are usually modeled as a whole building. For multifamily buildings designed for dwelling units to be owner-occupied, the project developer may favor providing a separate, unique energy compliance report for each dwelling unit. Floors and walls between dwelling units are considered to have no heat transfer and are treated as interior surfaces in performance calculations.

8.6.1 Whole-Building Compliance Approach

The simplest compliance for a multifamily building is treating the building as a whole, using the compliance paths described earlier. This is similar to analyzing a single-family residential building, except for differences described in the *2019 Residential ACM Reference Manual*.

Multifamily buildings that use efficiency measures that require HERS field verification must submit separate compliance documentation for each dwelling unit in the building as specified by Reference Residential Appendix RA2.3. This requirement does not prevent using the whole-building compliance approach to submit the certificate of compliance to the enforcement agency. For measures that requires HERS verification, a relationship to the whole-building certificate of compliance is made for the corresponding certificates of installation, and the dwelling-specific certificates of verification. Thus, for the whole-building compliance approach in a multifamily building the required energy compliance documentation for each dwelling unit should consist of a whole-building certificate of compliance (CF1R-PRF-01), a dwelling-specific certificate of installation (CF2R), and a dwelling-specific certificate of verification (CF3R).

When the whole-building compliance approach is used for a multifamily building, some of the energy efficiency measures that require HERS field verification cannot be used for compliance credit in the performance calculations. These HERS measures are excluded from the whole-building compliance approach because they require dwelling-specific data input into the compliance software.

The measures that cannot be used for the multifamily whole-building compliance approach, but can be used for credit when dwelling units are individually modeled, include:

- Buried ducts credit.
- Deeply buried ducts credit.
- Reduced supply duct surface area credit.
- Building envelope sealing credit (blower door test).

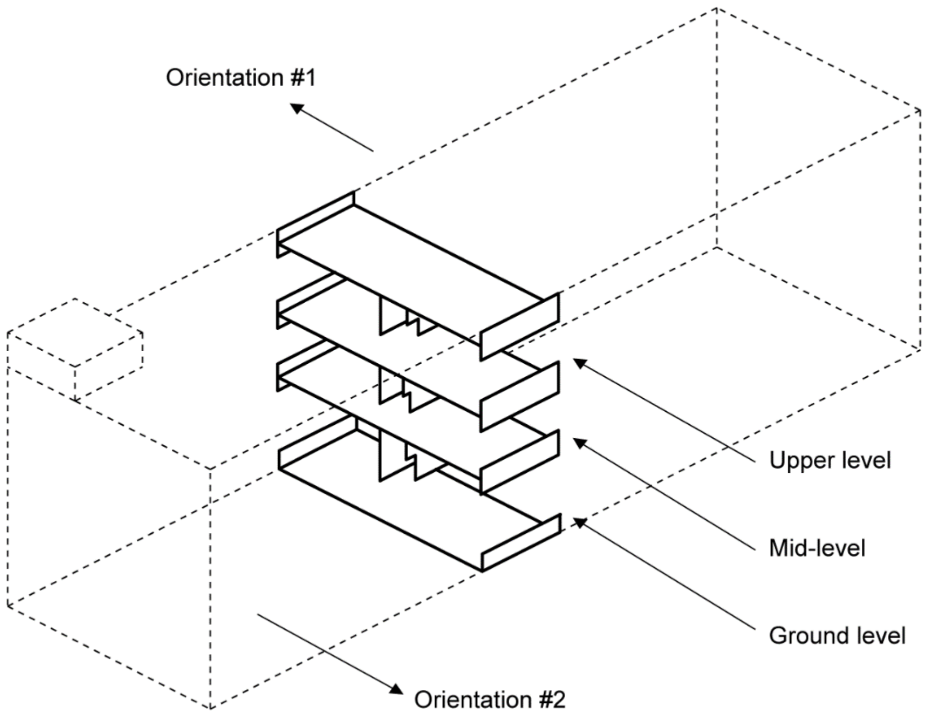
When the Energy Standards require registration of the compliance documents, the information for the certificate of compliance (CF1R), certificate of installation (CF2R), and certificate of verification (CF3R) must be submitted electronically to the HERS registry. Refer to Reference Residential Appendix RA2.3 for more about these document registration procedures.

8.6.2 Unit-by-Unit Compliance Approach – Fixed Orientation Alternative

The unit-by-unit compliance approach for multifamily buildings requires that each dwelling unit must demonstrate compliance separately. The fixed orientation alternative requires that each unique dwelling unit in the building, as determined by orientation and floor level, must be separately modeled using an approved compliance program. Surfaces that provide separation between dwelling units are treated as interior surfaces and are assumed to have no heat loss or heat gain. Surfaces that provide separation between dwelling units and central/interior corridor areas must be modeled if the corridor area is not directly conditioned or indirectly conditioned space. (See Reference Joint Appendix JA1 for definition.) If the corridor area is conditioned, the corridor area may be modeled separately.

Different orientations and locations of each unit type within the building must be considered separately. A one-bedroom apartment on the ground floor of a three-story building is different from the same plan on a middle floor or the top floor, even if all apartments have the same orientation and are otherwise identical. End units must be modeled separately from the middle units, and opposite end units must also be modeled separately. Every unit of the building must comply with the Energy Standards, so this unit-by-unit approach is more stringent than modeling the building as a whole (See Figure 8-1).

Figure 8-1: Multifamily Building Compliance Option



Demonstrate Compliance for Each Generic Unit Type in Each of its Characteristic Locations

Source: California Energy Commission

Example 8-2

Question

When preparing compliance calculations for a three-story apartment complex, I can show compliance for each dwelling unit or for the entire building. Are calculations for every dwelling unit needed if the individual dwelling unit approach is used?

Answer

No. When dwelling units have identical conditions, the calculations can be combined. Show separate compliance for all unique conditions, such as:

- Front-facing north.
- Front-facing west.
- Front/side walls facing east and north.
- Front/side walls facing east and south.
- Middle units and both end units.

- Exterior roof, no exterior floor.

- Exterior floor, no exterior roof.

Surfaces separating two conditioned spaces (such as common walls) are modeled as interior surfaces.

Note: For multiple dwelling units that are identical except orientation, a single multiple orientation report can be used to demonstrate compliance. (See Section 8.7.2 below.)

8.6.3 Unit-By-Unit Compliance Approach – Multiple Orientation Alternative

Another option for unit-by-unit compliance for a multifamily building is the multiple orientation alternative. This is similar to the method that may be used for single-family master plans in subdivisions (described in Section 8.7).

The performance method may be used to demonstrate that a dwelling unit plan in a multifamily building complies regardless of orientation. To ensure compliance in any orientation, the annual energy consumption must be calculated with cardinal orientation (a combined CF1R with results for north, east, south, and west). With this option, a dwelling unit plan must be modeled using the identical combination of energy features and must comply with the energy budget in each orientation. Cardinal compliance can be used to show compliance for a reversed floor plan.

Each unique dwelling unit plan must be modeled using the worst-case condition for the energy features that the plan may contain within the building (for example, highest glazing percentage, least overhangs, largest wall surface area, and with exterior walls instead of party walls, if applicable). See Reference Residential Appendix RA 2.6.2 for information that describes how to determine when a dwelling is a unique model. Each unique dwelling plan must also be modeled separately for each floor level.

8.7 Subdivisions and Master Plans

Subdivisions often require a special approach to energy compliance because they have one or a few basic building or unit plans repeated in a variety of orientations. The basic floor plans may also be used in a mirror image or reversed configuration.

The two compliance options for subdivisions are the following:

- Model each individual building, or building condition, separately according to the actual orientation.
- Model all four cardinal orientations for each building or plan type with identical conservation features for no orientation restrictions.

8.7.1 Individual Building Approach

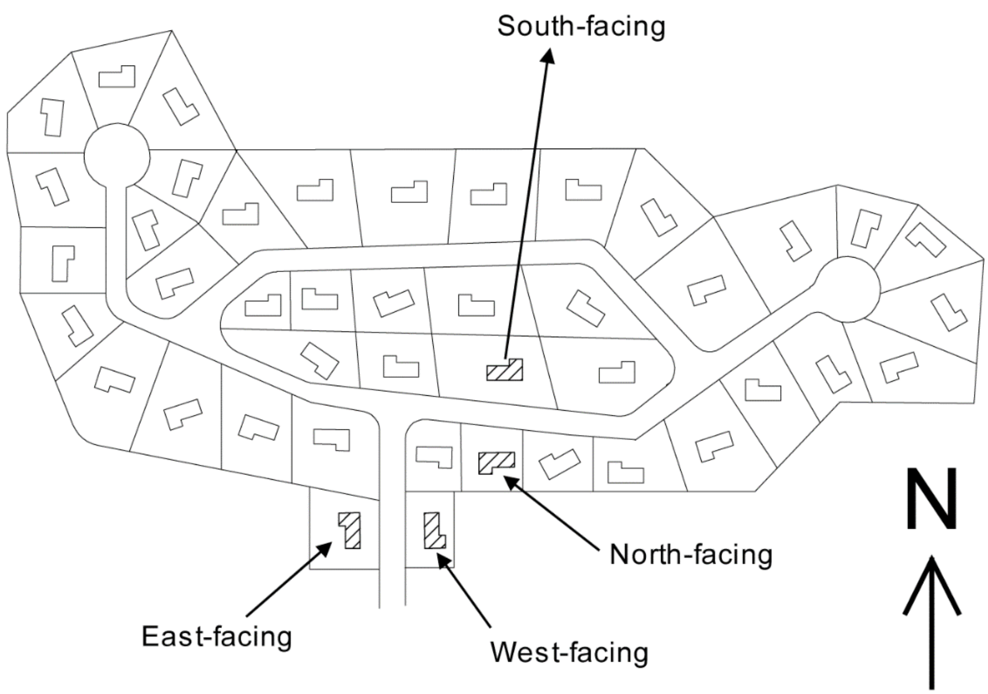
The most straightforward option for subdivisions is analyzing each building in the project separately using any compliance method. This may be practical for subdivisions with only custom buildings, or with only one or two specific orientations for each building plan. This approach requires that each unit comply separately, with separate documentation submitted for each unit plan in the orientation in which it will be constructed.

8.7.2 Multiple Orientation Alternative: No Orientation Restrictions

§150.1(b)

The performance method may be used to demonstrate that a single-family dwelling plan complies regardless of its orientation within the same climate zone. To ensure compliance in any orientation, the annual energy consumption must be calculated using cardinal orientation (a single CF1R with results for north, east, south, and west). The buildings must have the identical efficiency measures and levels and comply with the energy budget in orientation. Cardinal compliance can be used to show compliance for a reversed floor plan.

Figure 8-2: Subdivisions and Master Plans Compliance Option



Demonstrate Compliance for Each Cardinal Orientation for Each Basic Model Type

Source: California Energy Commission

For compliance, submit certificate of compliance documentation of the energy budgets for each of the four orientations to the enforcement agency. Only one CF1R form that documents compliance for all four orientations is required to be submitted to the enforcement agency for each unique or reverse plan.

Master plans that use the multiple orientation alternative must establish a connection to the CF1R in the HERS registry. For the multiple orientation compliance approach in a master plan subdivision , the required documentation for each dwelling unit should be a multiple orientation master plan certificate of compliance (CF1R), a dwelling-specific installation certificate (CF2R), and a dwelling-specific certificate of verification (CF3R).

8.8 HVAC Issues

8.8.1 No Cooling Installed

When a building has no cooling system, the software simulates a hypothetical system with the characteristics required by Table 150.1-A or B if a cooling system was installed. The result is neither a penalty nor a credit.

8.8.2 Wood Heat

When natural gas is not available, and all other eligibility criteria are met (see Chapter 4), a wood heating system is simulated as a hypothetical system with the characteristics required by Table 150.1-A or B for a typical heating system. When all eligibility criteria are met, the backup system is not modeled, otherwise see Section 8.8.3.

8.8.3 Multiple HVAC Systems

Buildings with multiple HVAC systems are treated as follows:

1. For buildings with more than one system type, equipment type, or fuel type, where the types do not serve the same floor area, model the building zone or floor area served by each unique type separately.
2. Supplemental heating may be ignored if two criteria are met: (1) If the capacity of the supplemental unit does not exceed 2 kilowatts (kW), or 7,000 British thermal units per hour (Btu/h), and (2) if the supplemental unit is controlled by a time-limiting device not exceeding 30 minutes. (§150.1[c]6.)

   In a building with an appliance rated gas fireplace and a central gas furnace, the furnace is the primary system and the fireplace is the supplemental system. The controls for the fireplace would not need to meet the setback thermostat requirements (exception to §110.2[c]).
3. For redundant equipment, where the floor area is served by more than one heating or cooling system, equipment type, or fuel type, model the least efficient system. For any areas served by electric resistance heat and another heating system (except for wood heating meeting all eligibility criteria), the electric resistance system is the least efficient system.

   When there is more than one system meeting the heating or cooling load for the same space, all systems must still meet all the mandatory requirements of the Energy Standards.

8.8.4 HERS Verified Efficiency

When higher than minimum efficiency is modeled, a HERS Rater must verify the efficiency. This includes seasonal energy efficiency ratio (SEER), energy efficiency ratio EER, and heating seasonal performance factor (HSPF).

8.8.5 Existing + Addition + Alteration Approach

The performance approach may be used to show compliance for alterations in existing buildings, new additions, and existing + addition + alteration discussed in

Chapter 9. The following table can be used when existing conditions are unknown. The table is based on the year of the building construction.

Table 8-1: Default Assumptions for year Built (Vintage)

Conservation Measure	Before 1978	1978 to 1983	1984 to 1991	1992 to 1998	1999 to 2000	2001 to 2003	2004 to 2005	2006 to 2013	2014 to Present
INSULATION U-FACTOR									
Cool Roof	0.10	0.10	0.10	0.10	0.10	0.10	0.10	Table 150.1-A or B	Table 150.1-A or B
Radiant Barrier	None	None	None	None	None	None	Table 150.1-A or B	Table 150.1-A or B	Table 150.1-A or B
Roof/Ceiling	0.079	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.031
Wall	0.356	0.110	0.110	0.102	0.102	0.102	0.102	0.102	0.102
Raised Floor –Crawl Space	0.099	0.099	0.099	0.049	0.049	0.049	0.049	0.049	0.037
Raised Floor-No Crawl Space	0.238	0.238	0.238	0.064	0.064	0.064	0.064	0.064	0.049
Slab Edge F-factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Ducts	R-2.1	R-2.1	R-2.1	R-4.2	R-4.2	R-4.2	R-4.2	Table 150.1-A or B	Table 150.1-A or B
LEAKAGE									
Building (ACH50)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	6.8	5.0
Duct Leakage (%)	15%	15%	15%	15%	15%	15%	15%	15%	6%
FENESTRATION									
U-factor	Use Energy Standards Table 110.6-A , §110.6 for all vintages.								
SHGC	Use Energy Standards Table 110.6-B , §110.6 for all vintages.								
Shading Devices	Exterior: Assumed to have 50% bug screens, model actual overhangs.								
SPACE HEATING EFFICIENCY									
Gas Furnace (Central) AFUE	0.75	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Gas Heater (Room) AFUE	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Hydronic/Comb Hydronic	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heat Pump HSPF	5.6	5.6	6.6	6.6	6.8	6.8	6.8	7.4	7.7
Electric Resistance HSPF	3.413	3.413	3.413	3.413	3.413	3.413	3.413	3.413	3.413
Electric Resistance Radiant HSPF	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.413
SPACE COOLING EFFICIENCY									
All Types, SEER	8.0	8.0	8.9	9.7	9.7	9.7	9.7	13.0	13.0
WATER HEATING									
Energy Factor	0.525	0.525	0.525	0.525	0.575	0.575	0.575	0.575	0.575