APPENDIX G
SUPPLEMENTAL INFORMATION FOR CHAPTER 11
of the *Florida Building Code, Residential*

SUBAPPENDIX G-A
Jurisdictional Data.
[No change]]

SUBAPPENDIX G-B
GENERAL REQUIREMENTS

B1.1 Baseline features. Baseline features for compliance method A shall be as described in Section N1113. These features are not code minimum efficiencies; rather, they represent standard reference design building component options utilized in establishing a budget that the building shall not exceed to comply with the code.

B1.2 Building envelope, insulation. All R-values referenced in this chapter refer to the R-values of the added insulation only. The R-values of structural building materials such as framing members, concrete blocks or gypsum board shall not be included. Insulation levels shall be achieved with insulation products tested and rated according to the procedures recognized by the Federal Trade Commission (FTC) in 16 CFR Part 460. See Section N1100.5.3 for compliance requirements pertaining to insulation installed in locations where the R-value is not readily apparent or the FTC label is not affixed to the installed product.

B1.2.1 When installing two layers of bulk or board insulation, the R-values of each material may be added together for a total R-value. When installing two separate reflective insulation products in layers, the total R-value of the system shall have been achieved by testing under FTC regulations, 16 CFR Part 460.

B1.2.2 Insulation that has been compressed to 85-percent or less of the manufacturer's rated thickness for the product shall use the R-values given in Table B1.2.2. These values are to be used except where data developed by an independent testing laboratory is provided and approved by the Florida Building Commission.

TABLE B1.2.2
R-VALUES OF COMPRESSED INSULATION

% of Original Thickness	R-5	R-7	R-11	R-14	R-19	R-30	R-38
90	5	6	10	13	18	28	36
80	4	6	10	12	17	26	33
70	4	5	9	11	15	24	30
60	3	5	8	10	14	22	27
50	3	4	7	9	12	18	24
40	2	4	6	8	10	15	20
30	2	3	4	6	8	12	16
20	20	2	2	3	4	10	10

B1.2.3 The thermal insulation materials listed below shall comply with the requirements of their respective ASTM standard specification and shall be installed in accordance with their respective ASTM installation practice in Table B1.2.3.

TABLE B1.2.3
INSULATION INSTALLATION STANDARDS

Insulation Material	Standard Specification	Installation Practice
Mineral Fiber Batt/Blanket	ASTM C 665	ASTM C 1320
Mineral Fiber Loose Fill	ASTM C 764	ASTM C 1015
Cellulose Loose Fill	ASTM C 739	ASTM C 1015
Polystyrene Foam	ASTM C 578	
Polyisocyanurate Foam	ASTM C 1289	
Reflective	ASTM C 1224	ASTM C 727
Radiant Barrier	ASTM C 1313	ASTM C 1158
Vermiculite	ASTM C 516	
Perlite	ASTM C 549	
Spray-Applied Rigid Cellular Polyurethane Foam	ASTM C 1029	
Interior Radiation Control Coating Systems		ASTM C 1321

B2.0 General Criteria for the Building envelope

B2.1 Glazing. U-factors (thermal transmittances) or SHGC for glazed fenestration products shall be determined in accordance with NFRC 100, Procedure for Determining Fenestration Product U-factors or NFRC 200, Procedures for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence, by an accredited, independent laboratory and labeled and certified by the manufacturer. See Section N1100.6.5.

B2.1.1 Unlabeled windows. When a manufacturer has not determined U-factor or SHGC in accordance with NFRC 100 or 200 for a particular product line, compliance with the building envelope requirements of this code shall be determined by assigning such products default U-factor or SHGC in accordance with Table B2.1.1. Product features must be verifiable for the product to qualify for the default value associated with those features. Where the existence of a particular feature cannot be determined with reasonable certainty, the product shall not receive credit for that feature. Where a

composite of materials from two different product types are used, the product shall be assigned the higher U-factor or SHGC.

TABLE B2.1.1
DEFAULT WINDOW ENERGY VALUES

Type	U-factor	Solar Heat Gain Coefficient (SHGC)
Single pane clear	1.30	0.75
Single pane tint	1.30	0.64
Double pane clear	0.87	0.66
Double pane tint	0.87	0.55

B2.1.2 The overhang length for adjustable exterior shading devices shall be determined for the overhang at its most extended position.
B2.1.3 All glazing areas of a residence, including windows, sliding glass doors, glass in doors, skylights, etc. shall include the manufacturer's frame area in the total window area. Window measurements shall be as specified on the plans and specifications for the residence.
When a window in existing exterior walls is enclosed by an addition, an amount equal to the area of this window may be subtracted from the glazing area for the addition for that overhang and orientation.

B2.2 Walls

B2.2.1 Exterior or adjacent walls consisting of more than one construction type or R-value shall be treated as separate walls.
B2.2.2 Walls separating an addition from the preexisting conditioned spaces shall not be included in the calculation.
B2.2.3 Common walls separating conditioned tenancies shall not be included as heat transfer areas in the As-Built or Baseline house envelope calculation.
B2.2.4 Walls that separate conditioned living space from unconditioned attic space, such as walls supporting cathedral ceilings and gambrel roofs, and skylight shafts, etc. shall be considered ceiling area for this calculation procedure.
B2.2.5 Net wall area (gross wall area of the building less all doors and windows) taken from the plans and specifications shall be used in the compliance calculation.

B2.3 Doors.

B2.3.1 Door areas shall be determined from the measurements specified on the plans for each exterior and adjacent door.
B2.3.2 All sliding glass doors and glass areas in doors shall be included in the glazing calculation and meet the requirements of Section N1101 unless the glass is less than one-third of the area of the door.

B2.4 Ceilings

B2.4.1 If different ceiling types or R-values are used in a house, each type or R-value shall be treated as a separate heat transfer area.
B2.4.2 Common ceilings shall not be included in the house envelope calculation.
B2.4.3 Ceilings separating an addition from the preexisting conditioned

spaces shall not be included in the calculation.

B2.4.4 As-built ceiling area shall be the actual ceiling area exposed to attic or single assembly roof conditions, including walls that separate conditioned living space from unconditioned attic space. Baseline ceiling area shall be the total floor area within the conditioned space located directly below the roof.

B2.5 Floors

B2.5.1 If the floor area consists of more than one type of construction or R-value, each floor system shall be treated as a separate floor heat transfer area.

B2.5.2 Common floors shall not be included in the calculation.

B2.5.3 Floors separating an addition from the preexisting conditioned spaces shall not be included in the calculation.

B2.5.4 Slab-on-grade floor perimeters shall be determined based on the linear footage of the slab which encloses the conditioned space, including both exterior and adjacent wall linear footage for single-family residential applications. In multiple-family applications, the slab linear footage between two conditioned tenancies shall be ignored.

B2.5.5 *Raised floor areas shall be determined based on the conditioned floor area of floors above unconditioned space.*

B2.5.6 Crawl space walls. As an alternative to insulating floors over crawl spaces, insulation of crawl space walls when the crawl space is not vented to the outside is permitted. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous vapor retarder.All joints of the vapor retarder shall overlap by 6 inches (152 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached to the stem wall.

B3.0 Infiltration and Internal Gains

B3.1 Infiltration area determination. The area to be considered in the Infiltration calculation of Method A shall be the total conditioned floor area of the building.

B3.2 Infiltration and internal gains shall be considered the same for both the baseline and as-built conditions.

B3.3 Infiltration barriers for frame construction. The following building materials and systems qualify as infiltration barriers when installed on the exterior of frame wall construction. Analogous methods apply to raised floor and ceiling construction.

B3.3.1 Plastic sheeting. Plastic sheeting products shall be considered air infiltration barriers when applied to a frame wall underneath an exterior finish and the following sealing requirements are met:

1. Sheeting shall be attached to the top plate by either:
    a. Mechanical fasteners and mastic, or
    b. Wrapping the sheeting over the top plate, then mechanically fastening it to the indoor faces of the plates. Sheeting shall be wrapped over the top plate prior to the trusses being set.
2. Sheeting shall be attached to the bottom plate by either:
    a. Mechanical fasteners and mastic to the bottom plate, foundation

wall, header and end joists, floor deck or slab edge, or
   b. Wrapping the sheeting under the bottom plate, then mechanically fastening it to the indoor faces of the plates
3. Sheeting shall be attached around doors and windows by either:
   a. Mechanical fasteners and mastic to the jams, or
   b. Mechanical fasteners to the framing members and mastic or pressure sensitive tape with acrylic adhesive to metal or plastic mounting fins, or
   c. Wrapping the sheeting around the door or window opening, then attaching with mechanical fasteners to the indoor face of the framing.
4. Sheeting shall be attached with mechanical fasteners at all seams. All seams shall be sealed by either applying a mastic or a pressure sensitive tape with acrylic adhesive to the lapped ends. Rubber-based adhesive tapes shall not be used for this purpose.

Tapes of any type are not acceptable for sealing plastic sheeting to wood or masonry building components.

B3.3.2 Wood sheathing. Wood sheathing panels shall be considered air infiltration barriers when applied to a frame wall underneath an exterior finish and the following sealing requirements are met:

1. Joints formed by the square edges of adjoining panels shall be backed by a framing member. The joints between panels shall be sealed, or both adjoining panels sealed to the framing member using a mastic. For joints formed by tongue and groove edges, the groove of the panels shall be filled with mastic prior to mating the panels.
2. The panels shall be sealed to the top plate using a mastic.
3. The panels shall be sealed to the bottom plate, floor deck, or header and end joists using mastic.
4. The panels shall be sealed to the jambs or mounting fins of doors and windows using a mastic.

Tapes of any type are not acceptable sealants for sealing wood sheathing to wood members, mounting fins, or masonry.

B3.3.3 Nonwood sheathing. Nonwood sheathing panels including foam insulation boards, and foil or plastic faced boards of other materials, shall be considered air infiltration barriers when applied to a frame wall underneath an exterior finish and the following sealing requirements are met:

1. Joints between adjoining panels shall be sealed using one of the methods given for wood sheathing boards in Section B3.3.2, (1) above or, joints between adjoining panels shall be sealed by pressure sensitive tape with acrylic adhesive. Rubber-based adhesive tapes shall not be used for this purpose.
2. The panels shall be sealed to the top plate using a mastic.
3. The panels shall be sealed to the bottom plate, foundation wall, header and end joists, floor deck, or slab using mastic.
4. The panels shall be sealed to the jams or mounting fins of doors and windows using a mastic. Acrylic-based tape may be used to seal metal and plastic door and window mounting fins to the sheathing panels.

Tapes of any type are not acceptable sealants for sealing nonwood sheathing to wood or masonry building components.

B3.3.4 Stucco infiltration barrier. Stucco on exterior frame walls may

qualify as an infiltration barrier if the following conditions are met:

1. Top plates, sill plates and sole plates or foundation joints to the stucco shall be sealed.
2. All holes in the outer wall face shall be patched. The entire exterior wall shall be coated with a weather-resistant stucco layer of at least a 5/8 inch (16 mm) thickness for cementitious stucco or ½ inch (12.7 mm) for polymeric stucco.

B3.4 Infiltration criteria for log wall construction. The following building materials, systems, or testing qualify as meeting the infiltration criteria for log wall construction:

1. Continuous groove logs. A continuous spline shall be caulked in place, or sealed with compressible foam gasket tape.
2. Single, double and/or multiple tongue and groove joints. Tongue and groove joints shall be caulked in place or sealed with compressible foam gasket tape.
3. Testing. The wall system shall have been tested by either a whole house air infiltration test procedure approved by the Department of Community Affairs or by ASTM E 283 to demonstrate a maximum air change per hour (ACH) rate of 17.5 at 50 pascals of pressure difference. Air flow rates in cubic feet per minute (CFM) shall be converted to air changes per hour (ACH).

B4.0 Heating, Ventilating and Air Conditioning

B4.1 General.

B4.1.1 Existing equipment. Minimum efficiencies for existing equipment shall be assumed from Tables B4.1.1A and B4.1.1B by the age of the unit unless documentation is available to demonstrate a higher efficiency.

TABLE B4.1.1A
COOLING SYSTEM to be ASSUMED,
MINIMUM RATINGS BY DATE PERMITTED
AIR CONDITIONERS

Date Building Permitted	Assumed Rating
Prior to 1979, average	EER 6.1
3/15/79 8/31/82	EER 6.1
9/1/82 5/31/84	EER 6.8
1/1/84 - 12/30/88	SEER 7.8
1/1/89 - 12/30/90	SEER 7.8
1/1/91 - 12/30/91	SEER 8.9
1/1/92 – 12/7/07	SEER 10.0
12/8/07 – present	SEER 13.0

TABLE B4.1.1B
HEATING SYSTEM ASSUMED,
MINIMUM RATINGS BY DATE PERMITTED
HEAT PUMPS

Date Building Permitted	Assumed Rating
Prior to 1979, average	COP 2.2
3/15/79 - 8/31/82	COP 2.2
9/1/82 - 5/31/84	COP 2.2
6/1/84 - 12/31/86	COP 2.5
1/1/87 - 12/30/90	COP 2.7
1/1/91 - 12/30/91	HSPF 6.8
1/1/92 – 12/7/07	HSPF 6.8
12/8/07 – present	HSPF 7.7

B4.1.2 Multiple heating or cooling systems. Where two or more systems of the same type are installed with different levels of efficiency serving different parts of the house, a capacity-weighted performance rating shall be used to determine compliance. The new effective efficiency rating shall be calculated by Equation B4.1.2.

Where two or more dissimilar systems, such as electric and fuel-fired systems, are utilized, separate calculations shall be made for the separate zones of the structure serviced by each.

$$ER_{new} = \frac{(CR_a \times ER_a)}{CR_t} + \frac{(CR_b \times ER_b)}{CR_t}$$

Equation B4.1.2

Where:
ER_{new} = Efficiency to be used in selecting multiplier
CR_a= Capacity Rating of system A
CR_b= Capacity Rating of system B
CR_t= Combined capacity of both systems
ER_a= Efficiency rating of system A
ER_b= Efficiency rating of system B

B4.1.3 Cross ventilation. The cross ventilation option may be used in the EnergyGauge USA Fla/Res computer program for cross ventilating a house where windows or doors are provided that meet the following criteria:

1. Operable aperture areas totaling a minimum of 12 percent of the floor area of the room shall be provided for all primary living areas and main bedrooms.
2. Insect screens shall be provided for all windows and doors to be considered operable aperture area. All screened entry doors and interior doors in the ventilated areas shall be provided with either (1) mechanically attached door stops (or similar devices) to hold the door in an open position or (2) operable louvers.
3. The total aperture area shall be provided by a minimum of two distinct windows. Each window shall provide not more than 70 percent of the total aperture area. The windows (or sliding glass doors) shall be placed in adjacent or opposite walls. The windows may be placed on a single outside wall if wing walls are used.
4. Where wing walls are included in the building design for ventilation purposes, they shall be placed between windows to create a high-pressure and a low-pressure zone on each window. Wing walls shall extend from the ground to eve height, be located on the windward side of the building, and extend outward from the building a distance at least equal to one-half the width of the window.

NOTE: This technique is effective only for areas which experience significant and continuous winds during the cooling months.

B4.1.4 Whole house fan. The whole house fan option may be used in the EnergyGauge USA Fla/Res computer program where a whole house fan is installed that meets following criteria:

1. The whole house fan has been sized to provide a minimum of 20 air changes per hour for the entire house.
2. The fan installed shall have a free air cfm rating of at least three times the square footage of the conditioned area of the house.
3. To ensure adequate air exhaust, the house attic shall have gable, ridge or wind turbine vents whose total opening area is equal to four times the ceiling cutout area for the whole house fan. Soffit vents shall not be included in the exhaust vent area.

B5.0 Air distribution systems.

B5.1 Ducts in conditioned space. For ductwork to qualify as being in conditioned space, it shall be located on the conditioned side of the envelope insulation and be situated in such a manner that any air leakage will be discharged into the conditioned space. Systems having no return air ducts or plenums between the air intake and the air handler, such as those in mechanical closets which communicate with the conditioned space, shall be considered systems with return ducts in conditioned space. Systems which have no ducts, such as PTACs and room air conditioners, qualify as ducts in conditioned space.

B5.2 Multiple duct systems. Where parts of the structure are to be served

by ductwork of different R-values, or by ducts in conditioned space, the duct calculation shall be performed by one of the following methods.

1. The smallest R-value may be used.
2. Each of the different duct R-values may be multiplied by the total duct area that has this insulation rating. The results are then summed and divided by the total area of the ductwork.

B5.3 Additions. If ducts are added to supply conditioned air to the addition, the ducts shall meet or exceed the minimum R-value requirements of this code. If conditioning is provided by existing ducts and registers or diffusers, a baseline duct shall be assumed.

B6.0 Service hot water.

B6.1 Water heater area determination. Water heating requirements are estimated based on the number of bedrooms in the residence. Any room which has an area of 70 square feet (7 m^2) or more and a clothes storage closet, and is not part of the common living area, shall be considered a bedroom for calculation purposes.

B6.2 Multiple water heating systems. Where two or more water heating systems are installed with different levels of efficiency, a single capacity-weighted efficiency shall be calculated for determining compliance with this code.

SUBAPPENDIX G-C
SUPPLEMENTAL CRITERIA FOR THE ALTERNATE RESIDENTIAL POINTS SYSTEM METHOD

C1.0 General requirements.

C1.1 Baseline features. The features in Section N1113 are utilized in compliance Method A as "baseline" features.- These features are not code minimum efficiencies; rather, they represent standard reference design building component options utilized in establishing a budget that the building shall not exceed to comply with the code.

C1.2 Interpolation from tables. Interpolation of multipliers for the Alternate Residential Points System Method is allowed by Equation C1.2 where rated efficiencies of installed components fall within a range. Extrapolations of multipliers above the highest value given or below the lowest values given shall not be permitted.

Equation C1.2
Interpolation From Tables

$$M_i = \frac{M_t - [(R_i - R_t) \times (M_t - M_a)]}{R_a - R_t}$$

Where:

Mi = Multiplier for rating of installed component
Mn = Multiplier for next (more efficient) range
Mt = Multiplier for range within which installed component falls
Ri = Efficiency rating of installed component
Rn = Reference rating for next (more efficient) range
Rt = Reference rating for range within which installed component falls

C2.0 Building Envelope Performance Criteria

C2.1 Windows

C2.1.1 Glass multipliers. Glass multipliers for the Alternate Residential Points System Method shall be as provided on Form 600A and expanded by Tables C2.1.1A through C2.1.1C of this appendix.

[No change to Table C2.1.1A, Table C2.1.1B and Table C2.1.1C]

C2.1.2 Assumptions. Three basic underlying assumptions were used in development of the FLA/RES window load correlation coefficients:

1. Frame area equals 25 percent of the total window area.
2. Frame U-factor equals glass U-factor equals overall U-factor.
3. Interior shading factor equals 0.70 in summer and 0.9 in winter.

The general equation for determining the window point multipliers is as follows:

$$PM = A_1*SC_o + A_2*U_o + A_3*(SC_o*U_o) + A_4*SC_o^2 + A_5*U_o^2$$

Equation C2.1.2A

Where:

PM = Point multipliers (load coefficient in kBtu/ft^2 of window)

SC_o = Overall shading coefficient of entire installed system including glass, frame and sash and interior treatments.

U_o = Overall U-factor of entire installed window system, including glass, frame and sash

A_i = Regression coefficients

Coefficients A_1 through A_5 vary by (1) season of the year, (2) by climate zone and (3) and by glass orientation (8 + horizontal = 9), such that there are 54 sets of A-coefficients needed to fully describe the window point multipliers (load correlation coefficients in subappendix C of this code). The general equation for window shading is given as follows:

$$SHGC_t = (A_f * SHGC_f + A_g * SHGC_g)/A_w \qquad \textbf{Equation C2.1.2B}$$

Where:

$SHGC_t$ = SHGC of total window system

A_f = frame area = 0.25

$SHGC_f$ = SHGC of the frame and sash

A_g = glass area = 0.75

$SHGC_g$ = SHGC of the glass

A_w = total window area = 1.00

The equation for the solution of $SHGC_f$ is as follows:

$$SHGCf = k * a * Uf/ho \qquad \textbf{Equation C2.1.2C}$$

Where:

$SHGC_f$ = SHGC of the window frame and sash

k = frame shape factor = 1.00

a = solar absorptance of frame = 0.77

U_f = U-factor of frame and sash = Ug

h_o = exterior air film coefficient = 4.00 Btu/hr-ft^2-F

On substitution, Equation C2.1.2 reduces to:

$$SHGCf = 1.00 * 0.77 * U_g / 4.00 = 0.1925 * U_g$$

The overall solar heat gain coefficient (SHGCo) of the installed window system and its treatments may be determined by multiplying the total solar heat gain coefficient (SHGCt) by the interior window treatment coefficient (ITC) as follows:

$$SHGCo = SHGCt * ITC \qquad \textbf{Equation C2.1.2D}$$

Where:

$SHGC_o$ = Combined SHGC of glass, frame, sash, interior window treatments

ITC = Interior window treatment coefficient

Combining Equation C2.1.2B thru Equation C2.1.2D yields the following simplified general equation for SHGCo:

$$SHGC_o = (0.048125 * U_g + 0.75 * SHGC_g) * ITC \qquad \textbf{Equation C2.1.2E}$$

A solar heat gain coefficient ($SHGC_i$) may also be defined in terms of a corresponding shading coefficient (SC_i) using the following constitutive relationship given by ASHRAE:

$$SHGC_i = SC_i * 0.87 \qquad \textbf{Equation C2.1.2F}$$

Thus, Equation C2.1.2E can be recast in terms of a glass shading coefficient (SC_g) as follows:

$$SC_o = (0.55316 * U_g + 0.75 * SC_g) * ITC \qquad \textbf{Equation C2.1.2G}$$

Where:

SC_g = Shading coefficient at the center-of-glass

Or, more simply, in terms of the most likely window manufacturer's product specification (SHGCt), the equation becomes:

$$SC_o = SHGC_t / 0.87 * ITC \qquad \textbf{Equation C2.1.2H}$$

C2.1.3 Glass orientation. Multipliers are provided on Form 600A by the glass orientation: N, NE, E, SE, S, SW, W, NW or H (horizontal).~~.~~

C2.1.4 Glass types. Multipliers are provided on Form 600A by glazing type, either single- or double-paned glass with either clear or tinted shading.

Where a SHGC for glazed fenestration products (windows, glazed doors and skylights) has been determined in accordance with NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence by an accredited, independent laboratory and labeled and certified by the manufacturer to be 0.57 or lower, a more favorable multiplier may be obtained from Tables C2.1.1A through C2.1.1C based on the climate zone in which it will be installed.

C2.1.5 Glass overhangs. Overhang factors shall be determined from Tables 6A-1 and 6A-10 on Form 600A by matching either the overhang ratio or the overhang length (in feet) with the orientation of the glass it shades. The overhang ratio shall be calculated by the following equation:

FIGURE C2.1.5
[No change to figure]

$$\textbf{OH Ratio} = \frac{OH_{Length}}{OH_{Height}}$$

Where:

OH_{Length} = The horizontal measure of how far a window overhang projects out from the glass surface.

OH_{Height} = The vertical measure of the distance from the bottom of a window to the bottom of the overhang.

C2.1.5.1 To select the overhang factor by the overhang length, no part of the glass shall be more than 8 feet (2438 mm) below the overhang.

C2.1.6 Between range calculation. In cases where an overhang length or solar heat gain coefficient falls between two glass percentage ranges and the glass type is the same throughout the addition, the specific glass percentage allowed may be determined by using the following equations:

Overhang (OH):

$$\text{Glass \% Allowed} = \text{Low \% Glass} + (\text{High \% Glass} - \text{Low \% Glass}) \times \frac{[OH_{Installed} - OH_{Low\%}]}{OH_{High\%} - OH_{Low\%}}$$

Solar heat Gain Coefficient (SHGC):

$$\text{Glass \% Allowed} = \text{Low \% Glass} + (\text{High \% Glass} - \text{Low \% Glass}) \times \frac{[SHGC_{Installed} - SHGC_{Low\%}]}{SHGC_{High\%} - SHGC_{Low\%}}$$

C2.2 Walls.

C2.2.1 Multipliers for lightweight concrete block shall be determined from Table C2.2.1. Light-weight block shall have an aggregate density of no greater than 105 pounds per cubic foot (1682 kg/m^3).

C2.2. 2 Multipliers for polystyrene bead aggregate block shall be determined from Table C2.2.2. Polystyrene bead aggregate block shall be composed of at least 60 percent polystyrene beads by volume, and shall achieve at least an R-8 insulation value when tested to ASTM C 236.

C2.2.3 Interpolation of multipliers for efficiencies falling within ranges may be made in accordance with Section C1.2 of this appendix.

TABLE C2.2.1
CONCRETE BLOCK MULTIPLIERS – LIGHT WEIGHT
[No change to table]

TABLE C2.2.2
CONCRETE BLOCK MULTIPLIERS POLYSTYRENE BEAD AGGREGATE
[No change to table]

C2.3 Doors Doors shall be identified as either exterior or adjacent, based on the type of wall in which they are located, and as wood or insulated. Multipliers for the type of door to be installed shall be determined from Tables 6A-3 and 6A-12 on Form 600A.

C2.4 Ceilings.

C2.4.1 Supplemental multipliers for ceilings under attics may be taken from Table C2.4.1. [Table C2.4.1 No change.]

C2.4.2 Supplemental multipliers for single assembly ceilings may be taken from Table C2.4.2. [Table 2.4.2 No change.]

C2.4.3 Supplemental multipliers for concrete deck roofs with exposed ceilings may be taken from Table C2.4.3. [Table C2.4.3 No change.]

C2.4.4 Supplemental multipliers for concrete roof decks with dropped ceilings may be taken from Table C2.4.4. [Table C2.4.4 No change.]

.

C2.5 Floors.

C2.5.1 Raised floors supported by stem walls with under floor insulation. Floor multipliers for stem walls with stem wall insulation shall be taken from Table C2.5. [Table C2.5 No change.]

C2.5.1.1 Floor vent area.

1. In raised floors supported by stem walls with under floor insulation, the vent area for the subfloor space shall not exceed 1 square foot (.0929 m^2) per 150 square feet (14 m^2) of floor area.

2. In raised floors supported by stem walls with stem wall insulation, the vent area for the subfloor space shall not exceed 1/10 square foot (.009 m^2) of open vent area per 150 square feet (14 m^2) of floor area when utilizing the stem wall with stem wall insulation multipliers. A continuous vapor barrier shall be applied over the ground under the floor.

C3.0 Infiltration and internal gains.

C3.1 Infiltration and Internal Gains Multipliers. Infiltration and internal gains shall be considered the same for both the baseline and as-built conditions. Multipliers for infiltration and internal gains shall be determined from Table 6A-6 on Form 600A for the cooling load and from Table 6A-15 for the heating load.

C4.0 Heating, Ventilating and Air Conditioning

C4.1 General

C4.1.1 Multiple heating or cooling. Where two or more systems of the same type are installed with different levels of efficiency serving different parts of the house, a single system multiplier may be calculated. To select a multiplier for a dual system, the efficiency ratings for the two systems shall be combined based on the percentage of the total capacity supplied by each system. The new effective efficiency rating shall be calculated by Equation C4.1.1.

Where two or more dissimilar systems, such as electric and fuel-fired systems, are utilized, separate calculations shall be made for the separate zones of the structure serviced by each.

$$ER_{new} = \frac{(CR_a \times ER_a)}{CR_t} + \frac{(CR_b \times ER_b)}{CR_t}$$

Equation C4.1.1

Where:

ER_{new} = Efficiency to be used in selecting multiplier

CR_a= Capacity Rating of system A

CR_b= Capacity Rating of system B
CR_t= Combined capacity of both systems
ER_a= Efficiency rating of system A
ER_b= Efficiency rating of system B

C4.1.2 Existing systems. Multipliers for existing HVAC systems shall be taken from Table C4.1.2A or C4.1.2B based on the year the system was permitted unless documentation is available to demonstrate another efficiency.

TABLE C4.1.2A
COOLING SYSTEM MULTIPLIER ASSUMED,
MINIMUM RATINGS BY DATE PERMITTED
AIR CONDITIONERS

Date Building Permitted	Assumed Rating	Cooling System Multiplier (all zones)
Prior to 1979, average	EER 6.1	0.56
3/15/79 8/31/82	EER 6.1	0.56
9/1/82 5/31/84	EER 6.8	0.50
1/1/84 - 12/30/88	SEER 7.8	0.44
1/1/89 - 12/30/90	SEER 7.8	0.40
1/1/91 - 12/30/91	SEER 8.9	0.38
1/1/92 – 12/7/07	SEER 10.0	0.34
12/8/07 – present	SEER 13.0	0.26

TABLE C4.1.2B
HEATING SYSTEM MULTIPLIER ASSUMED,
MINIMUM RATINGS BY DATE PERMITTED
HEAT PUMPS

Date Building Permitted	Assumed Rating	Heating System Multiplier		
		North	Central	South
Prior to 1979, average	COP 2.2	0.63	0.63	0.63
3/15/79 - 8/31/82	COP 2.2	0.63	0.63	0.63
9/1/82 - 5/31/84	COP 2.2	0.63	0.63	0.63
6/1/84 - 12/31/86	COP 2.5	0.56	0.54	0.53
1/1/87 - 12/30/90	COP 2.7	0.52	0.50	0.49
1/1/91 - 12/30/91	HSPF 6.8	0.53	0.53	0.53
1/1/92 – 12/7/07	HSPF 6.8	0.50	0.50	0.50
12/8/07 – present	HSPF 7.7	0.45	0.45	0.45

C4.1.3 Interpolation of multipliers. Interpolation of multipliers for equipment efficiencies falling within ranges may be made in accordance with Section C1.2 of this appendix.

C4.2 Cooling system. Multipliers shall be determined for air conditioners based on the appropriate efficiency rating for the system to be installed or from Table 6A-9 on Form 600A. Cooling system performance criteria and multipliers for systems not found on Form 600A may be found in Tables C4.2. Interpolation of multipliers for equipment efficiencies falling within ranges may be made in accordance with Section C1.2 of this Appendix.
[Table C4.2 No change.]

C4.2.1 Cooling system credits.

C4.2.1.1 Ceiling fan credit. Ceiling fan credit may be taken if one or more

ceiling fans are installed in each of the bedrooms and a minimum of one ceiling fan is installed in all primary living areas (living rooms, family rooms, or great rooms). This shall not include spaces designed to be dining rooms or dining areas. Areas separated by permanently fixed archways, walls, or dividers shall be considered separate rooms. The following criteria shall be met:

1. Ceiling fans shall be installed with minimum fan blade diameters of no less than those listed in Table C4.2.1.1 for the size and shape of the room.
2. Where a primary living area is an "L-shaped" room and the smaller portion of this area is 8 feet by 10 feet (2438 mm by 3048 mm) or larger, a fan shall be installed in both the larger and smaller portions of the primary living area.

Exception: Credit shall not be taken for both ceiling fans and cross ventilation.

TABLE C4.2.1.1
FAN SIZING TABLE

LONGEST WALL LENGTH (feet)	MINIMUM FAN SIZE (inches)
< 12	36
> 12 – 16	48
> 16 - 17.5	52
> 17.5 - 25	56
> 25	2 fans (minimum of 48 inches each)

C4.2.1.2 Multizone practice. Multizone credit may be taken if two or more spaces (zones) are completely separated from one another by walls, ceilings, floor and totally closing doors and meet the following criteria:

1. A separate thermostatic control shall be provided for each zone which provides independent conditioning.
2. Zones shall be completely separated from one another by walls, ceilings, floor and totally closing doors and shall be configured such that air exchange between them does not exist in a free flow manner. Doors between zones shall not exceed a total of 40 square feet (4 m^2).

Exceptions:

a. Where one zone consists of multiple rooms which may be isolated with closeable doors and are served by one air conditioning system, separation criteria may be met by providing separate return air ducts to each room. The common space connecting the rooms shall be part of another zone.

b. Between lower and upper floors in a multiple-story home.

3. No zone shall constitute more than 75 percent of the total conditioned floor area.

The multizone credit multiplier shall be determined from Table 6A-19 on Form 600A.

C4.2.1.3 Ventilation. Ventilation cooling credit may be taken for either

cross ventilating a house or by installing a whole house fan, but credit shall not be taken for both. Cooling credit for ventilation shall be determined from Table 6A-19 on Form 600A.

C4.2.1.3.1 Cross ventilation credit. Cross ventilation credit may be claimed where windows or doors are provided that meet the following criteria:

1. Operable aperture areas totaling a minimum of 12 percent of the floor area of the room shall be provided for all primary living areas and main bedrooms.
2. Insect screens shall be provided for all windows and doors to be considered operable aperture area. All screened entry doors and interior doors in the ventilated areas shall be provided with either (1) mechanically attached door stops (or similar devices) to hold the door in an open position or (2) operable louvers.
3. The total aperture area shall be provided by a minimum of two distinct windows. Each window shall provide not more than 70 percent of the total aperture area. The windows (or sliding glass doors) shall be placed in adjacent or opposite walls. The windows may be placed on a single outside wall if wing walls are used.
4. Where wing walls are included in the building design for ventilation purposes, they shall be placed between windows to create a high-pressure and a low-pressure zone on each window. Wing walls shall extend from the ground to eve height, be located on the windward side of the building, and extend outward from the building a distance at least equal to one-half the width of the window.

NOTE: This technique is effective only for areas which experience significant and continuous winds during the cooling months.

C4.2.1.3.2 Whole house fan credit. Whole house fan credit may be claimed where a whole house fan is installed and the following criteria are met:

1. The whole house fan has been sized to provide a minimum of 20 air changes per hour for the entire house.
2. The fan installed shall have a free air cfm rating of at least three times the square footage of the conditioned area of the house.
3. To ensure adequate air exhaust, the house attic shall have gable, ridge or wind turbine vents whose total opening area is equal to four times the ceiling cutout area for the whole house fan. Soffit vents shall not be included in the exhaust vent area.

C4.2.1.4 Attic radiant barriers. Cooling credit may be taken for attic radiant barriers where a radiant barrier system is to be installed in one of the configurations depicted in Figure C4.2.1.4 and the following conditions are met:

1. It shall be fabricated over a ceiling insulated to a minimum of R-19 with conventional insulation. The radiant barrier credit shall not be used as a means to achieve partial or whole compliance with the minimum attic insulation level of R-19 prescribed in Section N1104.ABC.1. Either a sheet type or spray applied interior radiation control coating (IRCC) may be used.
2. If the radiant barrier material has only one surface with high reflectivity or low emissivity it shall be facing downward toward the ceiling

insulation.
3. The attic airspace shall be vented in accordance with Section R806 of this code.
4. The radiant barrier system shall conform to ASTM C 1313, Standard Specification for Sheet Radiant Barriers for Building Construction Applications, or ASTM C 1321, Standard Practice for Installation and Use of Interior Radiation Control Coating Systems (IRCCS) in Building Construction as appropriate for the type of radiant barrier to be installed. The operative surface shall have an emissivity not greater than 0.06 for sheet radiant barriers or 0.25 for interior radiation control coatings as demonstrated by independent laboratory testing according to ASTM C 1371.
5. The radiant barrier system (RBS) shall conform with ASTM C 1158, Use and Installation of Radiant Barrier Systems (RBS) in Building Constructions for Sheet Radiant Barriers, or ASTM C 1321, Standard Practice for Installation and Use of Interior Radiation Control Coating Systems (IRCCS) in Building Construction for IRCC systems.
6. The radiant barrier shall be installed so as to cover gable ends without closing off any soffit, gable or roof ventilation.

Cooling credit shall be taken against the ceiling load by multiplying the summer point multiplier for the ceiling configuration and insulation level chosen from Table 6A-4 on Form 600A by a credit multiplier of the following:

Sheet type radiant barriers:
0.70 (all climate zones)
Interior Radiation Control Coatings:
0.849 North Florida
0.864 Central Florida
0.865 South Florida

FIGURE C4.2.1.4
ACCEPTABLE ATTIC RADIANT BARRIER CONFIGURATIONS
[No change to figure]

C4.2.1.5 Cool roof credit. Cool roof credit may be taken where a roof is installed that has a tested solar reflectance of greater than 4 percent when evaluated in accordance with ASTM Standard E-903. Testing of a qualifying sample of the roofing material shall be performed by an approved independent laboratory with these results provided by the manufacturer. Cooling credit shall be taken against the ceiling load by multiplying the summer point multiplier for the ceiling configuration and insulation level chosen on Form 600A by a credit multiplier according to the tested reflectance:

CM = 1.155 – 0.935 (Reflectance)

Where:
Reflectance = fractional (0-1)

Note that where a tested reflectance is not available the assumed roof reflectance will be 4% and a a CM value of 1.118 will be used for those which are untested. This is also true for those roofs that do not use the Cool Roof Credit.

C4.2.1.6 Programmable thermostats. The cooling credit multiplier for programmable thermostats shall be determined from Table 6A-19 on Form 600A.

C4.3 Heating systems. Multipliers shall be determined for heating systems based on the appropriate efficiency rating for the system to be installed or from Table 6A-18 on Form 600A. Interpolation of multipliers for equipment efficiencies falling within ranges may be made in accordance with Section C1.2.

C4.3.1 Heating system credits. Heating credit multipliers (HCM) are given for certain technologies which reduce energy use or cost. Heating credit may be taken for the options in this section where the criteria of C4.3.1.1 through C4.3.1.5 have been met for that option. Where more than one heating credit is taken, the multipliers for each option shall be multiplied together to obtain one multiplier.

C4.3.1.1 Attic radiant barriers. Attic radiant barrier credit may be taken when an attic radiant barrier is installed that is compliant with all requirements in Section C4.2.1.4. Heating credit shall be taken against the ceiling load by multiplying the winter point multiplier for the ceiling configuration and insulation level chosen from Table 6A-13 on Form 600A by a credit multiplier of the following:

Sheet type radiant barriers	0.85 (all climate zones)
Interior radiation control coatings	0.912 North Florida
	0.905 Central Florida
	0.899 South Florida

C4.3.1.2 Multizone practice. Multizone credit may be taken where two or more independent heating zones occur in a building that meets the prescriptive construction requirements in Section C4.1.2. The heating credit multiplier for multizone systems shall be determined from Table 6A-18 on Form 600A.

C4.3.1.3 Hydronic space water heating. Hydronic space gas heating credit multipliers may be used for houses where hydronic space gas water heating systems are installed where the effective space heating efficiency (CA afue) of the system (as listed by GAMA) has not been tested to ANSI/ASHRAE 124. Combined gas instantaneous (tankless) water heating and space heating systems may be rated based on the Thermal Efficiency (E_t) rating of the gas instantaneous (tankless) water heater in accordance with ANSI test method Z21.10.3. The heating system credit multiplier for combined hydronic space gas water heating with a storage tank shall be taken from Table C4.3.1.3A. The heating system credit multiplier for combined hydronic instantaneous (tankless) gas water heating shall be taken from Table C4.3.1.3B. A gas instantaneous (tankless) water heater shall be as defined in Section N1112.ABC.3.2.3.

TABLE C4.3.1.3A
HEATING SYSTEM CREDIT MULTIPLIERS FOR COMBINED HYDRONIC SPACE GAS WATER HEATING WITH A STORAGE TANK
[No change to table]

TABLE C4.3.1.3B-
HEATING SYSTEM CREDIT MULTIPLIERS FOR COMBINED HYDRONIC INSTANTANEOUS (TANKLESS) GAS WATER HEATING
[No change to table]]

C4.3.1.4 Programmable thermostats. Programmable thermostat credit may be claimed for houses installed with programmable thermostats that are capable of being set as follows:

Winter: 68°F (22°C) from 6 am - 11 pm
66°F (19°C) from 11 pm – 6 am

Houses for which programmable thermostat credit is claimed shall have one or more features on the thermostat that prevent supplemental heat from being automatically engaged. The heating credit multiplier for programmable thermostats shall be determined from Table 6A-21 on Form 600A.

C4.3.1.5 Cool roofs. Cool roof credit may be claimed for houses when a cool roof system is installed that is compliant with all requirements in Section C4.2.1.5. Heating credit shall be taken against the ceiling load by multiplying the winter point multiplier for the ceiling configuration and insulation level chosen on Form 600A by a credit multiplier according to the tested reflectance as shown below. Credit shall not be taken for both Attic radiant barrier and cool roofs in conjunction.

HM = 0.987 + 0.088 (Reflectance)

Note that where a tested reflectance is not available the assumed roof reflectance will be 4% and a HM value of 0.987 will be used for those which are untested. This is also true for those roofs that do not use the Cool Roof Credit.

C4.3.2 Other gas systems.

C4.3.2.1 Gas fueled heat pumps. Heating system multipliers for gas fueled air conditioners and heat pumps shall be taken from Table C4.3.2.

[Table C4.3.2 No change]

C4.3.2.2 Combination gas hydronic systems. Hydronic space water heating. Hydronic space gas heating multipliers may be used for houses where hydronic space gas water heating systems are installed in accordance with the following criteria:

1. Combined gas storage tank water heating and space heating systems that have been tested to ANSI/ASHRAE 124 may be rated based on the effective space heating efficiency (CA afue) as listed by the GAMA, or
2. Combined gas instantaneous (tankless) water heating and space heating systems may be rated based on the Thermal Efficiency (E_t) rating of the gas instantaneous (tankless) water heater in accordance with ANSI test method Z21.10.3.

Heating system multipliers to be used for combined gas storage tank water

heating and space heating systems may be determined from Table 6A-18 on Form 600A based on the effective space heating efficiency (CA afue) as listed by GAMA where the system has been tested to ANSI/ASHRAE 124.

C5.0 Air distribution systems.

C5.1 General

C5.1.1 Ducts in conditioned space. For ductwork to qualify as being in conditioned space, it shall be located interior to both the thermal envelope and the pressure envelope of the building. ~~on the conditioned side of the envelope insulation and be situated in such a manner that any air leakage will be discharged into the conditioned space.~~ Systems having no return air ducts or plenums between the air intake and the air handler, such as those in mechanical closets which communicate with the conditioned space, shall be considered systems with return ducts in conditioned space. Systems which have no ducts, such as PTACs and room air conditioners, shall be treated as un-ducted systems ~~qualify as ducts in conditioned space~~.

C5.1.2 Multiple duct systems. Where parts of the structure are to be served by ductwork of different R-values, or by ducts in conditioned space, the duct calculation shall be performed by one of the following methods.

1. The smallest R-value may be used.
2. Each of the different duct R-values may be multiplied by the total duct area that has this insulation rating. The results are then summed and divided by the total area of the ductwork.

C5.1.3 Additions. If ducts are added to supply conditioned air to the addition, the ducts shall meet or exceed the minimum R-value requirements of this code. If conditioning is provided by existing ducts and registers or diffusers, a baseline duct shall be assumed.

C5.2 Air distribution system multipliers.

C5.2.1 Duct multipliers. Multipliers for the type of duct system and insulation level to be installed shall be determined from Tables 6A-7 and 6A-16 on Form 600A. Multipliers for duct conditions not found on Form 600A may be found in Tables C5.2.1A for the climate zone where they are to be installed.

[Tables C5.2.1A, C5.2.1B and C5.2.1C No change.]

C5.2.1.1 Duct length determination. An estimate of the linear footage of duct shall be utilized on Form 600A.

C5.2.2 Air-handling unit multipliers. Air-handling unit multipliers shall be determined from Tables 6A-7 and 6A-16 on Form 600A by the location of the air handler in the building for summer and winter conditions.

C5.2.2.1 Air distribution system credits. Credits are given for air distribution system practices described in Sections C5.2.2.1.1 and C5.2.2.1.2. AHU credit multipliers shall be entered into the As-Built AHU boxes on Form 600A and calculated as part of the cooling and heating loads for the building.

C5.2.2.1.1 Air-tight duct credit. An air-tight duct credit multiplier of 1.0 may be taken if the duct work has been demonstrated to be “substantially leak free”. “Substantially leak free” shall mean distribution system air leakage to outdoors no greater than 3 cfm per 100 square feet of conditioned floor area and distribution system total air leakage to indoors and outdoors no greater than 9 cfm per 100 square feet of conditioned floor area at a pressure differential of 25 Pascal (0.10 in. w.c.) across the entire

air distribution system, including the manufacturer's air handler enclosure. Distribution system total air leakage no greater than 3 cfm per 100 square feet of conditioned floor area at a pressure difference of 25 Pascal across the entire system, including the manufacturer's air handler enclosure, shall be deemed to meet this requirement without measurement of distribution system air leakage to outdoors. Substantially leak free air distribution systems shall be certified by means of a test report prepared by a state-approved performance tester. A state-approved performance tester means a Class 1 Florida Energy Gauge Certified Energy Rater, State of Florida Mechanical Contractor or recognized test and balance agent. Contractors shall not test their own systems.

C5.2.2.1.2 Factory-sealed air-handling unit credit. A factory-sealed air-handling unit credit multiplier of 0.95 may be claimed if the unit has been tested and certified by the manufacturer to have achieved a 2 percent or less leakage rate at 1-inch water gauge when all air inlets, air outlets and condensate drain port(s), when present, are sealed at an air pressure of 1-inch water gauge with no greater than 2-percent design cubic foot per minute discharge.

C6.0 Service hot water.

C6.1 General

C6.1.1 Water heater area determination. Water heating requirements are estimated based on the number of bedrooms in the residence. Any room which has an area of 70 square feet (7 m^2) or more and a clothes storage closet, and is not part of the common living area, shall be considered a bedroom for calculation purposes.

C6.1.2 Multiple water heating systems. Where two or more water heating systems are installed with different levels of efficiency, a single multiplier shall be calculated for determining compliance with this code as per Equation C1.2 in Section C1.2 of this appendix. [Equation C1.2 No change]

C6.2 Water heater types and multipliers. Hot water multipliers for the water heating system to be installed shall be determined from Table 6A-22 on Form 600A based on the EF of the system.

C6.2.1 Gas instantaneous (tankless) water heater multipliers. Multipliers for gas instantaneous (tankless) water heaters shall be taken from Table C6.2.1 of this appendix.

Table C6.2.1
GAS INSTANTANEOUS (TANKLESS) WATER HEATER MULTIPLIERS
[No change to table]

C6.2.2 Hot Water Credit Multipliers. Hot water credit multipliers (HWCM) may be taken for if supplemental water heating systems or alternate systems are installed which meet the criteria in Sections C6.2.2.1 through C6.2.2.4. Electric resistance or natural gas water heating systems may be installed as backup to alternate water heating systems. HWCM shall be determined from Table 6A-23 on Form 600A for the alternate water heating system installed. Both a hot water multiplier (HWM) and a credit multiplier (HWCM) shall be used in the hot water calculation.

Electric resistance or natural gas water heating systems may be installed as backup to alternate water heating systems.

C6.2.2.1 Waste heat recovery unit. Credit may be claimed for installation of a waste heat recovery unit (HRU) on either an air conditioner or a heat pump where the heat recovery unit meets all the criteria for this section. Credit multipliers shall be determined from Table 6A-23 on Form 600A based on the type of system to which the HRU is attached.

1**.** To obtain credits under the code, a storage water heater which meets the minimum performance criteria of Section N1112.ABC shall be used in conjunction with the HRU. This water heater shall provide service hot water to the water circuit with the most fixtures in the residence and shall be sized as follows.

a. Two bedroom and up, single-family 50 gallon (189 L) tank min.

b. Two bedroom and up, multiple-family, and one bedroom single-family 40 gallon (151 L) tank min.

c. One bedroom multiple-family 30 gallon (114 L) tank min.

2. To obtain credit, a heat recovery unit shall be tested by an independent testing laboratory under the standard rating conditions specified in Florida Standard FL-1 (see Appendix G (E)) and shall have a minimum net useful heat exchange effect of 50 percent. A copy of Form 1100D (see Appendix G (D)) shall be prominently displayed on the heat recovery unit, with test results clearly visible for inspection through a transparent, weatherproof envelope. An ARDM certified refrigerant desuperheater seal affixed to the unit, clearly visible for inspection, may be substituted for the 1100D form. This seal indicates that the unit meets the criteria of this section.

3. Multiple HRUs on multiple air conditioners are allowed. If more than one air conditioning system is installed in a residence and only one HRU is installed, the HRU shall be attached to the system serving the daytime primary living areas (family room, living room, kitchen, dining room and adjacent bedrooms and bathrooms) to obtain credit. If the HRU is installed in a residence which has only one water heater, the entire HRU credit may be claimed. If more than one water heater is installed in the residence, credit may be claimed based on the gallon capacity of the water heater to which it is coupled and the total capacity of the water heaters in the residence by entering a calculation for each water heating system as follows:

C6.2.2.2 Dedicated heat pump. Credit may be claimed for installation of a dedicated heat pump, either as an add-on to a conventional water heater or as a separate integral system. The credit multiplier shall be determined from Table 6A-23 on Form 600A based on the EF of the system installed.

C6.2.2.3 Integrated heat pumps. Credit may be claimed for installation of an integrated heat pump, either as an add-on to a conventional water heater or as a separate integral system. The credit multiplier shall be determined from Table 6A-23 on Form 600A based on the combined cooling performance factor (CCPF) and the combined heating performance factor (CHPF) of the system installed. An equivalent dedicated heat pump EF shall be calculated according to Equation C6.2.2.3 where the various terms are defined in ASHRAE 137 and the DOE waiver granted to NORDYNE and published in the Federal Register Vol. 61, No. 55, Wednesday, March 20, 1996, pages 11395-11400.

[No change to Equation C6.2.2.3]

C6.2.2.4 Solar water heater. Credit may be claimed for installation of a solar water heater, either as an add-on to a conventional water heater or as a separate system (with tank). The credit multiplier for an add-on solar system (without tank) shall be determined from Table 6A-23 on Form 600A based on the EF of the system installed.

SUBAPPENDIX G-D
FORMS

Form 1100A-08~~7~~, All climate zones

[Modify the Baseline totals for Method A code compliance in the EnergyGauge USA Fla/Res computer program by a factor of 0.85 to make the code 15 percent more stringent than the 2007 code Baseline features.]

Form 600A-08 ~~7~~, All climate zones

[Modify Forms 600A North 123, Central 456 and South 789, page 4, **Baseline totals box** to read as follows. Note that brackets should surround the entire first part of the equation so that the sum of Base Cooling Points, Base Heating Points and Base Hot Water Points is multiplied by 0.85 to get Total Base Points]

BASE COOLING POINTS (From P. 2)	+	BASE HEATING POINTS	+	BASE HOT WATER POINTS (From P. 2)	**X 0.85**	=	TOTAL BASE POINTS (Enter on P. 1)

Form 1100B-07
[Change Page 2 as follows:]

Table 11B-1 Minimum Requirements (See Note 1) Climate Zones 1,2,3 4,5,6 7,8,9

Building Component	Performance Criteria	Installed Values:
Windows (see Note 2):	U-Factor = 0.75 SHGC = 0.40- % of CFA <= 16%	U-Factor = SHGC = % of CFA =
Exterior door type	Wood or insulated	Type:
Walls – Ext. and Adj. (see Note 3): Frame Mass	 All zones: R-13 North: Int. R-6; Ext: R-4 Central: Int: R-6 ; Ext: R-4 South: Int. R-4 ; Ext: R-3	 R-Value = R-Value = R-Value = R-Value =
Ceilings (see Notes 3 & 4):	R=30	R-Value =

Floors: Slab-on-Grade Over unconditioned spaces (see Note 3)	No requirement R-13	R-Value =
Hot water systems (storage type: Electric (see Note 5): Natural gas fired (see Note 6):	 40 gal: EF = 0.92 50 gal: EF = 0.90 40 gal: EF = 0.59 50 gal: EF = 0.58	 Gallons = EF = Gallons = EF =
Air conditioning systems (see Note 7)	SEER = 13.0	SEER =
Heat pump systems (see Note 8)	SEER = 13.0 HSPF = 7.7	SEER = HSPF =
Natural gas furnaces	AFUE = 78%	AFUE =
Oil furnaces	AFUE = 78%	AFUE =
Ductwork:	Unconditioned: R-6 Conditioned: R-4.2	Location: R-Value =
Air Handler location:	Garage, Attic or Interior	Location:

Table 11B-1 Notes:

(1) Each component present in the As-Built home must meet or exceed each of the applicable performance criteria in order to comply with this code using this method; otherwise Method A compliance must be used.

(2) Windows and doors qualifying as glazed fenestration areas must comply with both the maximum U-Factor and the maximum SHGC (solar Heat Gain Coefficient) criteria and have a maximum total window area equal to or less than 16% of the conditioned floor area (CFA), otherwise Method A must be used for compliance.

(3) R-Values are for insulation material only as applied in accordance manufacturers' installation instructions. For mass walls, the interior (Int) requirement must be met unless at least 50% of the insulation value is on the exterior (Ext) or integral to the wall.

(4) Attic knee walls shall be insulated to same level as ceilings and shall have a positive means of maintaining insulation in place. Such means may include rigid insulation board or air barrier sheet materials adequately fastened to the attic sides of knee wall framing materials.

(5) For other electric storage volumes, minimum EF = 0.97 - (0.00132 * volume)

(6) For other natural gas storage volumes, minimum EF = 0.67 - (0.0019 * volume)

(7) For all conventional units with capacities greater than 30,000 Btu/hr. For Small-Duct, High-Velocity units, Space Constrained units, and units with capacities less than 30,000 Btu/hr see Table 13-607.ABC.3.2A of the *Florida Building Code, Building,* or Table N1107.ABC.3.2A of the *Florida Building Code, Residential*.

(8) For all conventional units with capacities greater than 30,000 Btu/hr. For Small-Duct, High-Velocity units, Space Constrained units, and units with capacities less than 30,000 Btu/hr see Table 13-607.ABC.3.2B of the *Florida Building Code, Building,* or Table N1107.ABC.3.2B of the *Florida Building Code, Residential*.

Table 11B-2 [Change Swimming Pools and Spas to read as follows:]

Swimming Pools and Spas.	N1112.ABC.2.3.4	Spas & heated pools must have covers (except solar heated). Noncommercial pools must have a pump timer. Gas spa & pool heaters must have a minimum thermal efficiency of 78%. Heat pump pool heaters shall have a minimum COP of 4.0.

FORM 1100C-07 [No change to form]

SUBAPPENDIX G-E

FLORIDA STANDARD NO. 1 (FL-1)
FLORIDA REGULATORY MODIFICATIONS TO AIR-CONDITIONING & REFRIGERATION INSTITUTE (ARI) STANDARD 470-80
Effective April 1, 1986

[No change]