



# ENERGY STAR Multifamily New Construction

## National Rater Design Review Checklist <sup>1</sup>, Version 1 / 1.1 / 1.2 (Rev. 043)

**If pursuing Track A – HVAC Grading by Rater, complete this page. <sup>3</sup>**

Building Name: \_\_\_\_\_ Number of Units: \_\_\_\_\_ Permit Date: \_\_\_\_\_  
 Building Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

1. Partnership Status	Must Correct	Rater <sup>4</sup> Verified	N/A
1.1 Rater has verified and documented that builder or developer has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/ResPartnerDirectory">http://www.energystar.gov/ResPartnerDirectory</a> . Builder name: _____ Developer name: _____	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 ASHRAE Only: Rater has verified modeler is listed in the online directory: <a href="http://www.energystar.gov/ASHRAEDirectory">www.energystar.gov/ASHRAEDirectory</a> . Modeler name: _____ (Not required for buildings in California)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Rater has verified and documented that their company has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/ResPartnerDirectory">www.energystar.gov/ResPartnerDirectory</a> . <sup>5</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.4 Rater(s) signing checklists attest that they have completed EPA-recognized training and are credentialed by a Home Certification Organization (HCO) or meet the credential requirements of a Multifamily Review Organization (MRO).	<input type="checkbox"/>	<input type="checkbox"/>	-
1.5 Certification is being pursued for the whole building; all units and common spaces in the building are designed to meet the requirements below. <sup>6</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. High-Performance Fenestration</b> Specified fenestration meets or exceeds the levels in Items 2.1 and 2.2 based on location, Path, and the program version used to certify the building. <sup>76</sup>			
2.1 Dwelling units:			
2.1.1 Prescriptive: ENERGY STAR MF Reference Design requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.1.2 ERI and ASHRAE only: 2009 IECC or, for National v1.2, 2021 IECC residential requirements. <sup>86</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Common space: <sup>2</sup>			
2.2.1 ERI and Prescriptive: ENERGY STAR MF Reference Design requirements for Class AW windows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2.2 ASHRAE only: 2009 IECC or, for National v1.2, 2021 IECC commercial requirements. <sup>86</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. High-Performance Insulation</b> Specified ceiling <sup>9</sup> , wall <sup>108</sup> , floor, and slab-on-grade insulation meet or exceed the levels in 3.1 and 3.2 based on location, Path, and the program version used to certify the building. <sup>119, 1249, 1344</sup>			
3.1 Dwelling unit:			
3.1.1 Prescriptive: ENERGY STAR MF Reference Design requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 ERI & ASHRAE only: Either the Residential chapter or the "Group R" column in the Commercial chapter of the 2009 IECC or, for National v1.2, the 2021 IECC. See exceptions in Footnote <a href="#">911</a> . <sup>86, 1442</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Common space: <sup>2</sup> Either the Residential chapter or the "All Other" column in the Commercial chapter of the 2009 IECC, or for National v1.2 the 2021 IECC. See exceptions in Footnote <a href="#">911</a> . <sup>86, 1442</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4a. Review of ANSI / RESNET / ACCA 310 HVAC Design Report with ENERGY STAR Supplements <sup>76, 1543</sup></b>			
4a.1 The following documentation collected for records, with no applicable Items left blank. <sup>1644</sup>			
4a.1.1 For all dwelling units, HVAC design report(s) compliant with ANSI / RESNET / ACCA 310 and the National HVAC Design Supplement(s) to Std. 310 for Dwellings & Units.	<input type="checkbox"/>	<input type="checkbox"/>	-
4a.1.2 For common spaces using ANSI / RESNET / ACCA 310, HVAC design report(s) compliant with ANSI / RESNET / ACCA 310.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.1.3 National HVAC Design Supplement to Std. 310 for Common Spaces & Central Systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.2 For systems meeting Item 4a.1.1 or 4a.1.2, ANSI / RESNET / ACCA 310 design review criteria have been met for applicable housing type.	<input type="checkbox"/>	<input type="checkbox"/>	-
4a.3 Prescriptive Path: Dwelling Unit Mechanical Ventilation is <150% of ASHRAE 62.2-2013 requirements. <sup>1745</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.4 Dwelling Units: Total occupant gains do not exceed 645 Btuh per occupant. <sup>1846</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.5 Dwelling Units: Non-occupant internal gains are less than 3,600 Btuh.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.6 Dwelling Units: Cooling sizing % is within the cooling sizing limit selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.7 Common spaces: Item 2.3 is completed for all spaces in the building listed in Footnote <a href="#">19</a> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.8 Common spaces: Item 2.4 is equal to or greater than Item 2.3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date of Review: _____			
Rater Signature: _____ Rater Company Name: _____			



# ENERGY STAR Multifamily New Construction

## National Rater Design Review Checklist <sup>1</sup>, Version 1 / 1.1 / 1.2 (Rev. 043)

If pursuing Track B – HVAC Testing by FT Agent, complete this page.			
Building Name: _____ Number of Units: _____ Permit Date: _____			
Building Address: _____ City: _____ State: _____			
1. Partnership Status	Must Correct	Rater <sup>4</sup> Verified	N/A
1.1 Rater has verified and documented that builder or developer has an ENERGY STAR partnership agreement using <a href="http://www.energystar.gov/partnerlocator">www.energystar.gov/partnerlocator</a> . Builder name: _____ Developer name: _____	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 ASHRAE Only: Rater has verified modeler is listed in the online directory: <a href="http://www.energystar.gov/ASHRAEdirectory">www.energystar.gov/ASHRAEdirectory</a> . Modeler name: _____ (Not required for buildings in California)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Rater has verified and documented that their company is an ENERGY STAR Partner.	<input type="checkbox"/>	<input type="checkbox"/>	-
1.4 Rater(s) signing checklists attest that they have completed EPA-recognized training and are credentialed by a Home Certification Organization (HCO) or meet the credential requirements of a Multifamily Review Organization (MRO).	<input type="checkbox"/>	<input type="checkbox"/>	-
1.5 Certification is being pursued for the whole building; all units and common spaces in the building are designed to meet the requirements below. <sup>6</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. High-Performance Fenestration</b> Specified fenestration meets or exceeds the levels in Items 2.1 and 2.2 based on location, Path, and the program version used to certify the building. <sup>75</sup>			
2.1 Dwelling units:			
2.1.1 Prescriptive: ENERGY STAR MF Reference Design requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.1.2 ERI and ASHRAE only: 2009 IECC or, for National v1.2, 2021 IECC residential requirements. <sup>86</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Common space: <sup>2</sup>			
2.2.1 ERI and Prescriptive: ENERGY STAR MF Reference Design requirements for Class AW windows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2.2 ASHRAE only: Specified fenestration meets or exceeds 2009 IECC commercial requirements. <sup>86</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. High-Performance Insulation</b> Specified ceiling <sup>97</sup> , wall <sup>108</sup> , floor, and slab-on-grade insulation meet or exceed the levels in 3.1, 3.2 and 3.3 based on location, Path, and the program version used to certify the building. <sup>119, 1240, 1344</sup>			
3.1 Dwelling unit:			
3.1.1: Prescriptive: ENERGY STAR MF Reference Design requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2: ERI and ASHRAE only: Either the Residential chapter or the "Group R" column in the Commercial chapter of the 2009 IECC or, for National v1.2, the 2021 IECC. See exceptions in Footnote <sup>119, 86, 1314+2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Common space: <sup>2</sup> Either the Residential chapter or the "All Other" column in the Commercial chapter of the 2009 IECC or, for National v1.2, the 2021 IECC. See exceptions in Footnote <sup>119, 86, 1314+2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4b. Review of ENERGY STAR MFNC National HVAC Design Report <sup>19</sup></b>			
4b.1 National HVAC Design Report(s) collected for records, with no applicable Items left blank.	<input type="checkbox"/>	<input type="checkbox"/>	-
4b.2 National HVAC Design Report(s) reviewed by Rater for the following parameters (Nat'l MFNC HVAC Design Report Item # in parenthesis):			
4b.2.1 Prescriptive Path: Dwelling Unit Mechanical Ventilation (2.7) is <150% of ASHRAE 62.2-2013 requirements. <sup>1745</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.2 Cooling season and heating season outdoor design temperatures used in loads (3.4) are within the limits defined for the State and County, or US Territory, where the building will be built, or the designer has provided an allowance from EPA to use alternative values. All limits are published at <a href="http://www.energystar.gov/hvacdesigntemps">www.energystar.gov/hvacdesigntemps</a> . Note that revised (i.e., 2019 Edition) limits are required to be used for all HVAC Design Reports generated after 07/01/2020. <sup>2249</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.3 Number of occupants used in loads (3.6) is within ± 2 of each dwelling unit to be certified and total occupant gains (3.7) do not exceed 645 Btuh per occupant. <sup>1846</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.4 Conditioned floor area used in loads (3.8) is between 100 sq. ft. smaller and 300 sq. ft. larger than each dwelling unit to be certified. <sup>2320</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.5 Window area used in loads (3.9) is between 15 sq. ft. smaller and 60 sq. ft. larger than each dwelling unit to be certified, or for dwelling units to be certified with > 500 sq. ft. of window area, between 3% smaller and 12% larger. <sup>2424</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.6 Predominant window SHGC used in loads (3.10) is within 0.1 of predominant value in each dwelling unit to be certified. <sup>2522</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# ENERGY STAR Multifamily New Construction National Rater Design Review Checklist <sup>1</sup>, Version 1 / 1.1 / 1.2 (Rev. 043)

4b. Review of ENERGY STAR MFNC National HVAC Design Report (continued) <sup>19</sup>	Must Correct	Rater <sup>4</sup> Verified	N/A
4b.2.7 Mechanical ventilation used in loads (3.12) is the same as the ventilation design (2.7) for the given unit plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.8 Non-occupant internal gains (3.13) are less than 3,600 Btuh. <sup>19</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.9 Sensible & total heat gain are documented (3.15, 3.17) for the configuration of each dwelling unit to be certified. <sup>2623</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.10 Cooling sizing % (4.18) is within the cooling sizing limit (4.19) selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>4b.2.11 Common spaces: Item 2.8 is completed for all spaces in the building listed in Footnote 19.</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>4b.2.12 Common spaces: Item 2.9 is equal to or greater than Item 2.8.</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rater Name: \_\_\_\_\_ Date of Review: \_\_\_\_\_

Rater Signature: \_\_\_\_\_ Rater Company Name: \_\_\_\_\_



# ENERGY STAR Multifamily New Construction

## National Rater Design Review Checklist <sup>1</sup>, Version 1 / 1.1 / 1.2 (Rev. 043)

5. Additional Construction Document Review – Recommended, not required	
5.1 Air Sealing: Review construction documents to verify that air-sealing details at assemblies adjacent to exterior and unconditioned spaces are represented which, at a minimum, demonstrate compliance with checklist items in Section 4 of the National Rater Field Checklist (noted with an asterisk below). Items 5.1.9 and 5.1.10 are not verified by the Rater in the field, but are recommended.	
5.1.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed*.	<input type="checkbox"/>
5.1.2 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to $\geq R-10$ in CZ 4-8*.	<input type="checkbox"/>
5.1.3 Continuous top plate or blocking is at top of walls adjoining unconditioned space including at balloon-framed parapets, and sealed*.	<input type="checkbox"/>
5.1.4 Drywall sealed to top plate at all unconditioned attic / wall interfaces using caulk, foam, drywall adhesive (but not other construction adhesives), or equivalent material. Either apply sealant directly between drywall and top plate or to the seam between the two from the attic above*.	<input type="checkbox"/>
5.1.5 Rough opening around windows & exterior doors sealed*. <a href="#">2724</a>	<input type="checkbox"/>
5.1.6 Assemblies that separate attached garages from occupiable space sealed and, also, an air barrier installed, sealed, and aligned with these assemblies*. <a href="#">2826</a>	<input type="checkbox"/>
5.1.7 Attic access panels, roof hatches and drop-down stairs are gasketed (i.e., not caulked) or equipped with durable covers that are gasketed*. <a href="#">2926</a>	<input type="checkbox"/>
5.1.8 Doors adjacent to unconditioned space (e.g., attics, garages, basements), ambient conditions, or a unit entrance to a corridor / stairwell, made substantially air-tight with <u>doorsweep-door seal</u> and weatherstripping or equivalent gasket*.	<input type="checkbox"/>
5.1.9 Above-grade sill plates adjacent to conditioned space sealed to foundation or sub-floor. Gasket also placed beneath above-grade sill plate if resting atop concrete / masonry & adjacent to conditioned space. <a href="#">3027</a> , <a href="#">3128</a>	<input type="checkbox"/>
5.1.10 The gap between the common wall (e.g., the drywall shaft wall) and the structural framing between units sealed at all exterior boundaries.	<input type="checkbox"/>
5.2 Dwelling Unit Compartmentalization	
5.2.1 Review construction documents to verify that air-sealing details <a href="#">3229</a> are represented such that air exchange between the dwelling unit and outside as well as the dwelling unit and other adjacent spaces is minimized and designed to achieve compartmentalization less than or equal to 0.30 CFM50 per square feet of dwelling unit enclosure area, following procedures in ANSI / RESNET / ICC 380.	<input type="checkbox"/>
5.2.2 Seal all spaces 5.1.1-5.1.10 on adiabatic unit enclosure assemblies.	<input type="checkbox"/>
5.3 Prescriptive Path: Verify that Window-to-wall ratio $\leq 30\%$ . <a href="#">3339</a>	<input type="checkbox"/>
5.4 Verify that fully-aligned air barrier details are in compliance with checklist items in Section 2 of the National Rater Field Checklist.	<input type="checkbox"/>
5.5 Verify that thermal bridging details are in compliance with checklist items in Section 3 of the National Rater Field Checklist.	<input type="checkbox"/>
5.6 Verify that HVAC details are in compliance with checklist items in Sections 5 - 10 of the National Rater Field Checklist.	<input type="checkbox"/>
5.6.1 Verify that HVAC design includes access and means to measure the dwelling-unit mechanical ventilation airflow rate.	<input type="checkbox"/>
5.6.2 Verify that bedrooms with design airflow $\geq 150$ CFM are specified with a combination of transfer grilles, jump ducts dedicated return ducts, and/or undercut doors to achieve a Rater-measured pressure differential $\geq -5$ Pa and $\leq +5$ Pa with respect to the main body of the dwelling unit when all air handlers are operating.	<input type="checkbox"/>
5.6.3 Verify that Functional Testing Agent(s) hold(s) credential required to complete the applicable sections of the National HVAC Functional Testing Checklist for all HVAC equipment in the building. For Track A, a Functional Testing Agent is not needed to complete Sections 2 and 3 for HVAC systems that will be verified and graded by the Rater. <a href="#">3434</a>	<input type="checkbox"/>
5.7 Verify that Domestic Hot Water, Lighting, Appliances, Plumbing Fixtures, and Whole Building Utility Data Acquisition Strategy details are in compliance with checklist items in Sections 11 – 14 of the National Rater Field Checklist.	<input type="checkbox"/>



# ENERGY STAR Multifamily New Construction

## National Rater Design Checklist Footnotes, Version 1 / 1.1 / 1.2 (Rev.

043)

### Footnotes:

1. This Checklist applies to all dwelling units, sleeping units, common spaces <sup>2</sup>, and garages (open or enclosed) in the building being certified, and where specified, parking lots. These requirements apply to all Paths, unless otherwise specified. These requirements do not apply to parking garages or lots where the cost of the energy use of the parking garage or lot is not the responsibility of the Builder/Developer, Building Owner or Property Manager. This Checklist does not apply to commercial or retail spaces. This Checklist does not apply to common spaces that are located in buildings on the property without any dwelling or sleeping units. A 'sleeping unit' as defined by ANSI / RESNET / ICC 301, is a room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Where the term 'dwelling unit' is used in this Checklist, the requirement is also required of 'sleeping' units. The term 'building' refers to a structure that encompasses dwelling/sleeping units and (if present) common spaces, sharing one or more of the following attributes: a common street address, a common entrance or exit, central/shared mechanical systems, or structurally interdependent wall or roof systems. Attached structures such as townhouses and 4-story two-unit structures (commonly referred to as "2-over-2s") may be considered separate buildings if they are divided by a vertical fire separation wall from the foundation to the roof sheathing and share none of the other attributes listed above. A skyway or a breezeway that connects two structures is not considered a common entrance or exit.
2. The term 'common space' refers to any spaces in the building being certified that serve a function in support of the residential part of the building that is not part of a dwelling or sleeping unit. This includes spaces used by residents, such as corridors, stairs, lobbies, laundry rooms, exercise rooms, residential recreation rooms, and dining halls, as well as offices and other spaces used by building management, administration or maintenance in support of the residents.
3. To be eligible for Track A – HVAC Grading by Rater, dwelling units must have at least one unitary HVAC system including air conditioners or heat pumps up to 65 kBtu/h, or furnaces up to 125 kBtu/h (i.e., within the scope of ANSI / RESNET / ACCA 310). Track A – HVAC Grading by Rater shall use ANSI / RESNET / ACCA 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the schedule defined by the HCO or MRO that the building is being certified under for all dwelling unit systems.
4. The term 'Rater' refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater, Approved Inspector, as defined by ANSI / RESNET / IECC 301, or an equivalent designation as determined by a HCO or MRO; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/mftraining](http://www.energystar.gov/mftraining).  
As stated in the National Program Requirements, for Townhouses, all items shall be verified for each certified home and sampling protocols shall not be used. For other multifamily building types, Raters who operate under an MRO or an HCO Sampling Protocol are permitted to verify any Checklist Item designated "Rater Verified" using an MRO or HCO-approved sampling protocol. No parties other than Raters are permitted to use sampling to complete this Checklist.
5. Raters are only required to document the partnership status of their company once, for the first home that the Rater certifies for them.
- 4-6. The whole building must be submitted to the HCO or MRO for certification after required verification is complete for all units and common spaces, unless using the conditional certification process described in the ENERGY STAR Certification Process in the applicable Program Requirements.
- 5-7. All windows, doors and skylights must meet or exceed the U-factor and SHGC requirements specified in Tables 1 or 2 below. If no NFRC rating is noted on the window or in product literature (e.g., for site-built fenestration), select the U-factor and SHGC value from Tables 4 and 10, respectively, in 2013 ASHRAE Handbook of Fundamentals, Chapter 15. Select the highest U-factor and SHGC value among the values listed for the known window characteristics (e.g., frame type, number of panes, glass color, and presence of low-e coating). Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion.

Table 1: All Versions except National v1.2:

	Residential dwelling unit doors and windows (i.e., <b>not</b> classified "Class AW"*)	Structural dwelling unit windows and doors that are classified as "Class AW"*) and all skylights	Common Space †
ERI	2009 IECC Table 402.1.1 <del>86-</del>	2009 IECC Table 502.3 <del>86-</del>	ENERGY STAR MF Reference Design – for Class AW
ASHRAE	2009 IECC Table 402.1.1 <del>86-</del>	2009 IECC Table 502.3 <del>86-</del>	2009 IECC Table 502.3 <del>86-</del>
Prescriptive	ENERGY STAR MF Reference Design	Windows and Doors: ENERGY STAR MF Reference Design – for Class AW Skylights: 2012 IECC Table 402.3 <del>86-</del>	ENERGY STAR MF Reference Design – for Class AW

Table 2: National v1.2

	Residential dwelling unit doors and windows (i.e., <b>not</b> classified "Class AW"*)	Structural dwelling unit windows and doors that are classified as "Class AW"*) and all skylights	Common Space †
ERI	2021 IECC Table 402.1.2 <del>86-</del>	2021 IECC Table C402.4 <del>86-</del>	ENERGY STAR MF Reference Design – for Class AW
ASHRAE	2021 IECC Table 402.1.2 <del>86-</del>	2021 IECC Table C402.4 <del>86-</del>	2021 IECC Table C402.4 <del>86-</del>
Prescriptive	ENERGY STAR MF Reference Design	Windows and Doors: ENERGY STAR MF Reference Design – for Class AW Skylights: 2012 IECC Table 402.3 <del>86-</del>	ENERGY STAR MF Reference Design – for Class AW



# ENERGY STAR Multifamily New Construction

## National Rater Design Checklist Footnotes, Version 1 / 1.1 / 1.2 (Rev.

### 043)

\* Classified as "Class AW" under the North American Fenestration Standard (AAMA / WDMA / CSA 101 / I.S.2 / A440).

† Opaque doors in common spaces in CZ1-6 shall not exceed U-0.70, and in CZ 7-8, shall not exceed U-0.5.

The following exceptions apply:

- i. An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
- ii. An area-weighted average of fenestration products  $\geq 50\%$  glazed shall be permitted to satisfy the SHGC requirements; and
- iii. 5% of all combined fenestration area (glazed and opaque) shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using i) and ii), above.

In Phius or PHI certified buildings, where triple-glazed window assemblies with thermal breaks / spacers between the panes are used, such windows meet the intent of Items 2.1 and 2.2 and shall be excluded when assessing compliance of i) through iii), above.

~~6-8.~~ For all Versions except National v1.2, the 2009 IECC Climate Zone designations are applicable, as defined and illustrated in Section R301 of the code. For National v1.2, the 2021 IECC Climate Zone designations are applicable, as defined and illustrated in Section R301 of the code. Note that some locations have shifted to a different Climate Zone in the 2021 IECC compared to prior editions.

~~7-9.~~ All insulated ceiling surfaces, regardless of slope (e.g., cathedral ceilings, tray ceilings, conditioned attic roof decks, flat ceilings, sloped ceilings), must meet the requirements for ceilings, unless the ceiling is adiabatic, such as the insulated or uninsulated ceiling between two dwelling units in a multistory building. Where the term "ceiling" is used, the component insulation levels for "roofs" shall be used.

~~8-10.~~ Items 3.1 and 3.2 are applicable to walls that are adjacent to other buildings, the exterior, or a garage. ~~Where the wall assembly includes continuous insulation that is interrupted by fasteners or service openings, an assembly U-factor must be calculated. For the interrupted portions, the continuous insulation cannot contribute to the assembly U-factor and an overall U-factor shall be calculated based on an area weighted ratio. Thermally broken shelf angles are exempt from de-rating.~~

~~9-11.~~ To comply with Items 3.1 and 3.2, specified ceiling, wall, floor, and slab-on-grade insulation must meet or exceed the levels in Tables 3 or 4 below based on location, Path, and the program version used to certify the building. Where identifying insulation requirements from the IECC, values from either the R-value or U-factor table may be used for compliance.

Table 3: All Versions Except National v1.2:

ERI and ASHRAE	Dwelling Unit Options		Common Space Options	
	2009 IECC Residential Chapter†	2009 IECC Commercial Chapter "Group R" Column	2009 IECC Residential Chapter†	2009 IECC Commercial Chapter "All Other" Column
Prescriptive	ENERGY STAR MF Reference Design			

Table 4: National v1.2

ERI and ASHRAE	Dwelling Unit Options		Common Space Options	
	2021 IECC: Residential Chapter†	2021 IECC Commercial Chapter "Group R" Column	2021 IECC Residential Chapter†	2021 IECC Commercial Chapter "All Other" Column
Prescriptive	ENERGY STAR MF Reference Design			

†When referencing the R-value from the Residential chapter, steel-frame components must use the table for steel-frame ceilings, walls, and floors.

The following exceptions apply:

- a. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38, R-38 shall satisfy the requirement for R-49, and R-49 shall satisfy the requirement for R-60 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in e) are used;
- b. For ceilings without attic spaces, that are not roofs with insulation above deck, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof / ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 20% of the total insulated ceiling area. This exemption shall not apply if the alternative calculations in e) are used;
- c. When referencing the 2009 IECC Commercial chapter, buildings in Climate Zone 4 and Climate Zone 5/Marine 4 may use U-0.089 and U-0.064 respectively for Group R wood-framed walls instead of the printed U-0.064 and U-0.051.
- d. An alternative total UA calculation may also be used to demonstrate compliance, as follows:

For all Versions, the total building thermal envelope UA shall be less than or equal to the total UA resulting from multiplying the U-factors specified in Items 2.1, 2.2, 3.1, and 3.2 by the same assembly area as the building to be certified.

ERI and ASHRAE Paths Only: Exception for buildings permitted before 01/01/2025 and certified using National v1.2

The total building thermal envelope UA shall be less than or equal to 105% of the total UA resulting from multiplying the U-factors in Item 2.1, 2.2, 3.1 and 3.2 by the same assembly area as the building to be certified.

The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method. In jurisdictions designated by a code official as having Very Heavy Termite Infestation, the total UA limit shall be calculated by replacing the code-required slab insulation R-value and depth with the slab insulation R-value and depth specified in the building to be certified.

The performance of all components (i.e., roofs, walls, floors, slabs-on-grade, and fenestration) can be traded off using the UA approach. Note that Items 1.5, 1.6, and 3.1 through 3.7 of the National Rater Field Checklist shall be met regardless of the UA tradeoffs calculated.



# ENERGY STAR Multifamily New Construction

## National Rater Design Checklist Footnotes, Version 1 / 1.1 / 1.2 (Rev.

043)

**12.** Slab edge insulation is only required for slab-on-grade floors with a floor surface less than 24 inches below grade. Slab-on-grade perimeter insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. The following alternatives apply:

a. Slab assemblies with an F-Factor equivalent to that of the insulation required in Item 3.4 of the National Rater Field Checklist may be used. F-Factors shall be determined using Table A6.3.1-1 from ASHRAE 90.1-2022 Appendix A. See [www.energystar.gov/F-Factor](http://www.energystar.gov/F-Factor) for more details.

~~b. Alternatively,~~ †The thermal break is permitted to be created using ≥ R-3 rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).

**14.13.** Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the building, slab perimeter insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab, if the slab is in contact with the ground at that interface. Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the building’s certification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: [www.energystar.gov/slabeledge](http://www.energystar.gov/slabeledge). If an exemption is used, then the Total UA Compliance option (5c) within the Multifamily Workbook must be used to demonstrate compliance with Section 3 if the ASHRAE Path or Prescriptive Path is used, and may be used to demonstrate compliance if the ERI Path is used. F-Factors shall be determined using Table A6.3.1-1 from ASHRAE 90.1-2022 Appendix A. See [www.energystar.gov/F-Factor](http://www.energystar.gov/F-Factor) for more details.

**14.14.** For each Item, when referencing either IECC Residential or Commercial, all building components subject to that Item shall meet or exceed the residential levels or all building components shall meet or exceed the commercial levels. It is not permitted to choose the Residential chapter for one building component within an Item and the Commercial chapter for another building component within the same Item. However, it is permitted to choose the IECC residential levels for Item 3.1.2 and choose the IECC commercial levels for Item 3.2.2 (or vice versa).

**14.15.** If pursuing Track A, all dwelling units must complete Items 4a.1.1 and 4a.2. Item 4a.3 shall be completed for dwelling units in buildings pursuing the Prescriptive Path. Items 4a.4 through 4a.6 shall be completed if any dwelling units in the building to be certified contain an air conditioner or heat pump; otherwise, ‘N/A’ shall be checked. All common space systems and central systems must be documented within the HVAC Design Supplement to Std. 310 for Common Spaces & Central Systems. Where a system type within the scope of ANSI / RESNET / ACCA 310 serves a single common space, it may also be verified for MFNC using the ANSI / RESNET / ACCA Standard 310 process, and then Items 4a.1.2 and 4a.2 must be completed.

**14.16.** As an alternative, the ENERGY STAR SFNH National HVAC Design Report may be collected in lieu of the ENERGY STAR National HVAC Design Supplement to Std. 310 for Dwellings & Units. In such cases, at least two documents will still be collected – an HVAC design report compliant with ANSI / RESNET / ACCA Std. 310 plus the ENERGY STAR SFNH National HVAC Design Report. Note that for buildings with more than one HVAC system, one ENERGY STAR SFNH National HVAC Design Report per system would need to be collected. For buildings with central systems or common space systems that are not using Track A, the ENERGY STAR National HVAC Design Supplement to Std. 310 for Common Spaces & Central Systems must also be collected.

**14.17.** Raters may use this table to determine the maximum ventilation rate allowed. Where the Exhaust Fan Type in Item 2b of the HVAC Design Report indicates “Continuous” for both Bathroom and Kitchen, the Rater may use this equation to determine the maximum ventilation rate allowed: 30 CFM x number of bathrooms + 75 CFM.

Floor area	Number of Bedrooms				
	1	2	3	4	5
<500	45	57	67.5	79.5	90
501-1000	67.5	79.5	90	102	112.5
1001-1500	90	102	112.5	124.5	135
1501-2000	112.5	124.5	135	147	157.5
2001-2500	135	147	157.5	169.5	180
2501-3000	157.5	169.5	180	192	202.5
3001-3500	180	192	202.5	214.5	225
3501-4000	202.5	214.5	225	237	247.5
4001-4500	225	237	247.5	259.5	270
4501-5000	247.5	259.5	270	282	292.5

**14.18.** To determine the number of occupants among all HVAC systems in the dwelling unit, calculate the number of bedrooms, as defined below, and add one. The number of occupants used in loads must be within ± 2 of the dwelling unit to be certified.

A bedroom is defined by ANSI / RESNET / ICC 301-2014 as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A “den”, “library”, or “home office” with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.



# ENERGY STAR Multifamily New Construction

## National Rater Design Checklist Footnotes, Version 1 / 1.1 / 1.2 (Rev.

043)

An egress window, as defined in 2009 IRC Section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

- have a sill height of not more than 44 inches above the floor; AND
- have a minimum net clear opening of 5.7 sq. ft.; AND
- have a minimum net clear opening height of 24 in.; AND
- have a minimum net clear opening width of 20 in.; AND
- be operational from the inside of the room without the use of keys, tools or special knowledge.

19. The following spaces require outdoor air ventilation: corridors, offices, break rooms, gyms, fitness centers, exercise rooms, lobbies, community rooms, meeting rooms, multi-purpose rooms, lounges, laundry rooms, swimming pools, daycares, classrooms, shared or commercial kitchens, shared dining rooms, and computer rooms.

47-20. If pursuing Track B, then Section 4b shall be fully completed if any dwelling unit contains split air conditioners, unitary air conditioners, air-source heat pumps, and water-source (i.e., geothermal) heat pumps up to 65 kBtuh with forced-air distribution systems (i.e., ducts), or furnaces up to 225 kBtuh with forced-air distribution systems (i.e., ducts). For a building without any of these system types in the dwelling units, collection of the National HVAC Design Report is still required and reviewed per Items 4b.2.1, 4b.2.11 and 4b.2.12 where applicable, for all buildings pursuing the Prescriptive Path the report must be reviewed per Item 4b.2.1, but EPA does not require that the report be reviewed per Item 4b.2.2 – 4b.2.10. For Track B systems that are documented using the SFNH HVAC Design Report, where room-by-room loads are calculated using Unabridged ACCA Manual J v8 and where occupant gains and non-occupant gains are not reported, items 4b.2.3 and 4b.2.8 may be marked “N/A”. Where the HVAC designer has checked the “N/A” box in Section 3 of the National HVAC Design Report, the Rater shall confirm that all dwelling unit heating and cooling systems are exempt (i.e., non-ducted mini-splits or multi-splits, PTACs, or PTHPs) and mark “N/A” for Items 4b.2.2-4b.2.10.

48-21. The Rater shall collect the National HVAC Design Report(s) per building. See Footnote 1 of the National HVAC Design Report for alternatives. Where using an ENERGY STAR Single-Family New Homes National HVAC Design Report, Rater must still review all Items under 4b.2. Regardless of whether the “unit-specific design”, “group design”, or “worst-case design” box has been checked in Item 3.2 of the National HVAC Design Report, the system design as documented on the National HVAC Design Report must fall within the tolerances in Item 4b.2 for the unit to be certified. The Rater is only responsible for verifying that the designer has not left any applicable items blank on the National HVAC Design Report and for verifying the discrete objective parameters in Item 4b.2 of this Checklist, not for verifying the accuracy of every input on the National HVAC Design Report. Buildings certified under Rev. 04 of the program requirements are permitted to use any Revision of the MFNC National HVAC Design Report.

49-22. Visit [www.energystar.gov/hvacdesigntemps](http://www.energystar.gov/hvacdesigntemps) for the maximum cooling season design temperature and minimum heating season design temperature permitted and the process for a designer to obtain an allowance from EPA. The same design report is permitted to be used in other counties, as long as the design temperature limits in those other counties meet or exceed the cooling and heating season temperature limits for the county selected. For example, if Fauquier County, VA, is used for the load calculations, with a 1% cooling temperature limit of 93 °F, then the same report could be used in Fairfax County (which has a higher limit of 94 °F) but not in Arlington County (which has a lower limit of 92 °F).

20-23. Conditioned Floor Area for the dwelling unit to be certified shall be calculated in accordance with the definition in ANSI / RESNET / ICC 301-2019.

24-24. Window area for the dwelling unit to be certified shall be calculated in accordance with the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC 301-2019.

22-25. “Predominant” is defined as the SHGC value used in the greatest amount of window area in the dwelling unit.

23-26. The Rater shall confirm that the designer has documented the loads for all the configurations (e.g., level, orientation) that the dwelling unit might be built in. For example, if a unit plan will only be built in a specific level and orientation (e.g., top-floor, facing South), then the designer only needs to document the loads for this one configuration. Orientation represents the direction that the front door of the dwelling unit is facing.

24-27. In Climate Zones 1 through 3, a continuous stucco cladding system sealed to windows and doors is permitted to be used in lieu of sealing rough openings with caulk or foam.

25-28. For dwelling or sleeping units adjacent to garages, EPA recommends, but does not require, carbon monoxide (CO) alarms installed in a central location in the immediate vicinity of each separate sleeping zone and according to NFPA 720.

26-29. Examples of durable covers include, but are not limited to, pre-fabricated covers with integral insulation, rigid foam adhered to cover with adhesive, or batt insulation mechanically fastened to the cover (e.g., using bolts, metal wire, or metal strapping).

27-30. Existing sill plates (e.g., in a building undergoing a gut rehabilitation) on the interior side of structural masonry or monolithic walls may not be able to complete this Item. In addition, other existing sill plates resting atop concrete or masonry and adjacent to conditioned space can in lieu of using a gasket, be sealed with caulk, foam, or equivalent material at both the interior seam between the sill plate and the subfloor and the seam between the top of the sill plate and the sheathing.

28-31. In Climate Zones 1 through 3, a continuous stucco cladding system adjacent to sill and bottom plates is an alternate option of sealing plates to foundation or sub-floor with caulk, foam, or equivalent material.

29-32. Recommended air leakage paths to be sealed include, but are not limited to the following:

- a. Plumbing penetrations, including those from water piping, drain waste and vent piping, HVAC piping, and gas line piping.
- b. Electrical penetrations, including those for receptacle outlets, lighting outlets / fixtures, communications wiring, thermostats, and smoke alarms.
- c. HVAC penetrations, including those for fans and for exhaust, supply, transfer, and return air ducts.





# ENERGY STAR Multifamily New Construction

## National Rater Design Checklist Footnotes, Version 1 / 1.1 / 1.2 (Rev.

043)

- d. Envelope penetrations, including at the intersection of baseboard trim and floor, at the intersection of walls and ceilings, around window trim and dwelling unit doors, including the door latch hole.

~~30.33.~~ Window-to-Wall ratio is taken as the sum of all window area divided by the total exterior above-grade wall area. All decorative glass and skylight window area contribute to the total window area to above-grade wall ratio (WWR). Spandrel sections of curtain wall systems contribute to the above-grade wall area.

~~31.34.~~ Functional Testing Agents must hold an approved credential, as listed at [www.energystar.gov/ftas](http://www.energystar.gov/ftas), or must be a representative of the Original Equipment Manufacturer (OEM), or a contractor credentialed by an HVAC Quality Installation Training and Oversight Organization (H-QUITO), if not completing Sections 6 and higher. Functional Testing Agents may not be the installing contractor, nor employed by the same company as the installing contractor, unless they are a credentialed contractor. An explanation of the credentialing process and links to H-QUITOs, which maintain lists of credentialed contractors, can be found at [www.energystar.gov/findhvac](http://www.energystar.gov/findhvac). A directory of other FT Agents can be found at [www.energystar.gov/ftas](http://www.energystar.gov/ftas).