



# DRAFT Caribbean Rater Design Review Checklist <sup>1</sup>

## ENERGY STAR Multifamily New Construction, Version 1 (Rev. 02)

Project Name: _____ Number of Units: _____ Permit Date: _____		
Project Address: _____ City: _____ State: _____		
<b>1. Partnership Status</b>	<b>Must Correct</b>	<b>Rater <sup>3</sup> Verified</b>
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"/>
<b>2. Review of ENERGY STAR MFNC National HVAC Design Report</b> (National HVAC Design Report Item # indicated in parenthesis) <sup>4</sup>		
2.1 National HVAC Design Report collected for records, with Sections 1 and 2 completed.	<input type="checkbox"/>	<input type="checkbox"/>
2.2 National HVAC Design Report reviewed by Rater for the following parameters (National HVAC Design Report Item # indicated in parenthesis):		
2.2.1 Prescriptive Path: Dwelling Unit Mechanical Ventilation (2.7) is <150% of ASHRAE 62.2-2013 requirements. <sup>5</sup>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. Solar Water Heating System</b>		
3.1 If system is specified, specified system is Solar Rating & Certification Corporation (SRCC) OG-300 certified. <sup>6</sup>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Review of Thermal Comfort System Design</b>		
4.1 Operable apertures (e.g. windows, skylights, window air inlets) specified in dwelling units that meet the following requirements:		
4.1.1 For all primary living areas, <sup>7</sup> operable aperture areas totaling a minimum of 12% of the floor area of the room specified in that room. <sup>8</sup> Components contributing to the operable aperture area specified to be able to be opened without the use of ladders or special tools.	<input type="checkbox"/>	<input type="checkbox"/>
4.1.2 The total operable aperture area specified in each room shall be provided by a minimum of two components. <sup>9</sup> No single component shall contribute $\geq 70\%$ of the total operable aperture in each room.	<input type="checkbox"/>	<input type="checkbox"/>
4.1.3 The specified components contributing to the operable aperture area in each room shall be located on two or more exterior walls except when placed on a single exterior wall with wing walls. <sup>10</sup> If placed on adjacent walls, components shall be placed at a minimum of one third of the wall width from the adjoining corner.	<input type="checkbox"/>	<input type="checkbox"/>
4.1.4 Insect screens specified for all components that contribute to the operable aperture area.	<input type="checkbox"/>	<input type="checkbox"/>
4.1.5 All components that contribute to the operable aperture area specified to include an integral device that is capable of holding the component in an open position. <sup>11</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4.1.6 All interior doors in primary living areas <sup>7</sup> specified to include a mechanically-attached door stop or similar device capable of holding the door in an open position.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Solar gain through windows, including for common spaces, shall be reduced through one of the following options:		
4.2a Option A		
4.2.2a Windows shall have $\leq 0.85$ U-Value; $\leq 0.25$ SHGC, <b>AND</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
4.2.3a Skylights shall have $\leq 0.70$ U-Value; $\leq 0.30$ SHGC, <b>AND</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
4.2.4a If total window-to-floor area ratio $> 15\%$ , then SHGCs adjusted as outlined in Footnote 13. <sup>12</sup> OR	<input type="checkbox"/>	<input type="checkbox"/>
4.2b Option B		
4.2.1b North-facing windows shall have an overhang with a projection factor $\geq 0.30$ <sup>13</sup> , <b>AND</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
4.2.2b All windows not North-facing shall have an overhang $\geq 3$ ft. deep and with a projection factor $\geq 0.40$ <sup>13</sup> , <b>AND</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
4.2.3b Windows in all bedrooms and any mechanically cooled rooms shall have: $\leq 1.2$ U-Value; $\leq 0.35$ SHGC, <b>AND</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
4.2.4b Skylights shall have $\leq 0.70$ U-Value; $\leq 0.30$ SHGC, <b>AND</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
4.2.5b Window-to-floor area ratio $\leq 18\%$ .	<input type="checkbox"/>	<input type="checkbox"/>
4.3 One ceiling fan (i.e., not just a junction box) specified in every primary living area and designated common space <sup>7,14</sup> greater than 75 ft <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5. Mini-Split HVAC System Pre-Installation Details</b>		
5.1 For all dwelling units, if a mini-split HVAC system will <u>not</u> be installed in the bedrooms at the time of certification, then the following details shall be included so that a mini-split HVAC system may be installed more easily after certification. If a mini-split HVAC system will be installed at the time of certification, then check "N/A". <input type="checkbox"/> N/A		
5.1.1 An outdoor location has been designated on the plans for the future installation of a mini-split condensing unit and indoor locations have been designated on the plans for future installation of wall-mounted mini-split fan-coil units to serve the bedrooms.	<input type="checkbox"/>	<input type="checkbox"/>
5.1.2 A wall-mounted junction box has been specified at code height within the designated area for the condensing unit along with electrical conduit from the junction box to the main electric panel board for the dwelling, to be installed at the time of certification.	<input type="checkbox"/>	<input type="checkbox"/>



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5.1.3 A 3" pipe sleeve through the exterior wall has been specified, to be installed at the time of certification, for future power, communication, and refrigerant line connections between the area designated for the condensing unit and fan-coil units.	<input type="checkbox"/>	<input type="checkbox"/>
5.1.4 If the designated location of the wall-mounted mini-split fan-coil units is on an interior wall, then a 1" condensate drain line insulated with 1/2" thick elastomeric or equivalent insulation has been specified with a point of connection at the fan-coil units and that terminates in storm water lines or outdoors, to be installed at the time of certification.	<input type="checkbox"/>	<input type="checkbox"/>
<b>6. Additional Construction Document Review – Recommended, not required</b>		
6.1 Verify that HVAC details are in compliance with checklist items in Sections 1-4 of the Caribbean Rater Field Checklist.		<input type="checkbox"/>
6.1.1 Verify that HVAC design includes access and means to measure the dwelling-unit mechanical ventilation airflow rate.		<input type="checkbox"/>
6.2 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 6 of the Caribbean Rater Field Checklist		
6.2.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed.		<input type="checkbox"/>
6.2.2 Rough opening around windows & exterior doors sealed. <sup>15</sup>		<input type="checkbox"/>
6.2.3 Assemblies that separate attached garages from occupiable space sealed and, also, an air barrier installed, sealed, and aligned with these assemblies. <sup>16</sup>		<input type="checkbox"/>
6.2.4 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 doorsweep and weatherstripping or equivalent gasket.		<input type="checkbox"/>
6.2.5 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"/>
6.3 Verify that Domestic Hot Water, Lighting, and Whole Building Utility Data Acquisition Strategy details are in compliance with checklist items in Sections 8 – 10 of the Caribbean Rater Field Checklist.		<input type="checkbox"/>
6.4 Verify that building design meets the requirements of Exhibit 1: ENERGY STAR Multifamily Reference Design in the Caribbean Program Requirements		<input type="checkbox"/>

Rater Name: _____	Date of Review: _____
Rater Signature: _____	Rater Company Name: _____



# DRAFT Caribbean Rater Design Checklist Footnotes

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### 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 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. The term 'sleeping unit' refers to 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 utilized or intended for supporting or sheltering occupancy for a residential purpose; a structure with no dwelling or sleeping units connected to a structure with dwelling or sleeping units by less than 10% of its exterior wall area is not to be included in the 'building'.
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. 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, or an equivalent designation as determined by a Verification Oversight Organization or Multifamily Review Organization and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/mftraining](http://www.energystar.gov/mftraining).
4. The Rater shall collect one National HVAC Design Report per building / project. The Rater is only responsible for verifying that the designer has not left any items blank on the National HVAC Design Report and for verifying the discrete objective parameters in Item 2.2 of this Checklist, not for verifying the accuracy of every input on the National HVAC Design Report.
5. Raters may use this table to determine the maximum ventilation rate allowed.

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

6. For more information, visit [www.solar-rating.org/programs/og-300-program/](http://www.solar-rating.org/programs/og-300-program/).
7. Primary living areas within dwelling units include dining rooms, living rooms, family rooms, dens, bedrooms and offices. Primary living areas do not include other spaces within dwelling units, such as kitchens, bathrooms, hallways, stairways, entrances, and utility rooms.
8. Operable area shall be based on the free unobstructed area through the aperture. Obstructions that can be removed from the aperture by the occupant without tools or special knowledge, such as blinds, shades, or operable shutters shall not be included when calculating the unobstructed area. For the purposes of this checklist item, 90% of the nominal window or door area of jalousie window and door products shall be permitted to be used as the free unobstructed area.
9. For example, components could consist of two windows or one window and one door.
10. 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 bottom to the top of the window and extend outward from the building a distance at least equal to one-half the width of the window. Additionally, it is recommended but not required that the wing wall be located on the windward side of the building.
11. For example, an integral device could consist of a mechanically-attached door stop or operable louvers for exterior doors.
12. All decorative glass and skylight window areas count toward the total window area to above-grade conditioned floor area (WFA) ratio. For homes that have a WFA ratio > 15%, the following improved window SHGC shall be used:  

$$\text{Improved SHGC} = [0.15 / \text{WFA}] \times 0.27$$
13. South-facing windows are those within 22.5 degrees of true south. North-facing windows are those within 22.5 degrees of true north. The window projection factor shall be determined in accordance with Equation 5-1 of the 2009 IECC:

$$\text{PF} = \text{A} / \text{B}$$

Where PF is the projection factor, A is the distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing and B is the distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.



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14. Designated common spaces include exercise rooms, residential recreation rooms, dining halls and offices.
15. 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.
16. 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.