

# ENERGY STAR<sup>®</sup>

## Residential New Construction Programs

### Historical Document

This document is provided for reference because it has been superseded by a more recent Version or Revision. Please find current program documents on the [Program Requirements](#) webpage.

Use of older Versions and Revisions, such as this document, are typically limited to homes and buildings with a permit date (or, for manufactured homes, a production date) prior to a specified date. Consult the [Implementation Timeline](#) table to assess whether a home or apartment is still eligible to be certified using this document.

For questions or more information, contact us at [energystarhome@energystar.gov](mailto:energystarhome@energystar.gov).



# ENERGY STAR Multifamily New Construction

## Quality Control Checklist (ERI Path), v1 / 1.1 / 1.2 (Rev. 04)

An ENERGY STAR Quality Control Checklist shall be completed during each quality control file review and field review (QC review) of buildings being certified through the ENERGY STAR Multifamily New Construction program's ERI Path in accordance with the policies and procedures of the Home Certification Organization (HCO) <sup>1</sup>. This revision of the QC checklist is mandatory for buildings certified under Version 1 / 1.1 / 1.2, Revision 04. QC reviews for buildings certified using earlier Revisions may continue to use the prior matching revision of this document, which can be found in the [Archives](#). Review complete instructions on page 6 below.

### ENERGY STAR Quality Control Checklist

Building Name: _____		Number of Units: _____		Permit Date: _____		
Building Address: _____		City: _____		State: _____		
<b>QC Review</b>	Review Type: <input type="checkbox"/> File <input type="checkbox"/> Field	QC Reviewer: _____		Date of Review: _____		
	Unit Number: _____	Common Spaces: _____				
	Rater Being QC'd: _____	Status of Building: <input type="checkbox"/> Pre-drywall <input type="checkbox"/> Final construction or completed				
<b>Original Rating</b>	Energy Rating Company: _____		<input type="checkbox"/> Confirmed as ENERGY STAR Partner			
<b>Pre-Drywall Inspection:</b>	Rater Name: _____	Rater ID #: _____	Date: _____	<input type="checkbox"/> MFNC Training Complete		
<b>Final Inspection:</b>	Rater Name: _____	Rater ID #: _____	Date: _____	<input type="checkbox"/> MFNC Training Complete		
<b>Action Items / Summary of QC</b>				<b>Yes</b>	<b>No</b>	<b>N/A</b>
If any Item marked "No" or "Not Verified," an action/explanation summary document shall be attached.				<input type="checkbox"/>	-	<input type="checkbox"/>
<b>Documentation Collection</b>				<b>Yes</b>	<b>No</b>	<b>N/A</b>
A) Energy Rating File collected.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B) Documentation collected that demonstrates that all dwelling units in the multifamily building were registered and certified to the same version.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C) National Rater Design Review Checklist collected, with no applicable Items left blank.				<input type="checkbox"/>	<input type="checkbox"/>	-
D) Documentation that builder or developer has an ENERGY STAR partnership agreement.				<input type="checkbox"/>	<input type="checkbox"/>	-
E) Documentation that Rater has an ENERGY STAR partnership agreement.				<input type="checkbox"/>	<input type="checkbox"/>	-
F) Documentation that Rater completed EPA-recognized training and is credentialed by an HCO.				<input type="checkbox"/>	<input type="checkbox"/>	-
<b>If Track A – HVAC Grading by Rater was pursued:</b>						
G) 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, collected, and for common spaces using ANSI / RESNET / ACCA 310, HVAC design report(s) compliant with ANSI / RESNET / ACCA 310 collected, with no applicable Items left blank.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H) National HVAC Design Supplement to Std. 310 for Common Spaces & Central Systems collected, with no applicable Items left blank.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I) For all systems using ANSI / RESNET / ACCA 310, ANSI / RESNET / ACCA 310 design review criteria have been met for applicable housing type.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>If Track B – HVAC Testing by FT Agent was pursued:</b>						
G) ENERGY STAR National HVAC Design Report collected, with no applicable Items left blank.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J) National Rater Field Checklist collected, with no Items left blank or marked Must Correct.				<input type="checkbox"/>	<input type="checkbox"/>	-
List of any exemptions or alternatives used by the Rater.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per 1.2, 3.5, and/or 3.6, documentation collected on alternative UA calculations, if used for compliance.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per 5b.1, written approval from designer collected, if installed models do not match Design Report.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per 7.3 and 8.3, documentation collected of the measured ventilation airflows in common spaces.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per 12.1, documentation collected on exemption for safety concerns, if used for compliance.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per 12.3, documentation collected that 90% fixtures are LEDs or lighting power density calculations collected for common spaces and shared garages.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per 14.1, for buildings 50,000 ft and larger, documentation collected confirming the strategy used to enable the collection of monthly or annual building-level energy consumption data.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name, Rater inspection dates, and Rater initials are recorded.				<input type="checkbox"/>	<input type="checkbox"/>	-
If any Builder Verified Items are used, builder employee, builder inspection date and builder initials are recorded.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If any LP Verified Items are used, Licensed Professional, LP inspection date and LP initials are recorded.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# ENERGY STAR Multifamily New Construction Quality Control Checklist (ERI Path), v1 / 1.1 / 1.2 (Rev. 04)

K) National HVAC Functional Testing Checklist(s) collected for common space systems and Dwelling Unit systems with no applicable Items left blank and with all HVAC systems in the building fully documented. Exception: Where credentialed HVAC Contractor(s) are completing the National HVAC Functional Testing Checklist, the checklist is not required to be collected. For Track A, Sections 2 and 3 do not need to be completed for systems meeting Items 5a.1-5a.3 of the Rater Field Checklist. Where sampling was used by the Functional Testing Agent, documentation collected that describes the sampling plan and confirms the appropriate number of tests were completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L) Documentation collected that Functional Testing Agent(s) held credential required to complete the National HVAC Functional Testing Checklist(s) and were listed on the appropriate online directory at the time of certification.	<input type="checkbox"/>	<input type="checkbox"/>	-
<b>Energy Rating File</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Energy Rating file passes the Home Certification Organization's (HCO's) quality control review checklist. <sup>1</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
ERI of the dwelling unit meets or exceeds the ENERGY STAR ERI Target for the program version applicable at the time of certification.	<input type="checkbox"/>	<input type="checkbox"/>	-
Energy Rating file is consistent with the National Rater Design Review Checklist	<input type="checkbox"/>	<input type="checkbox"/>	-
2.1.2 Modeled dwelling unit fenestration meets or exceeds 2009 IECC or, for National v1.2, 2021 IECC residential chapter. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
3.1.2 Modeled dwelling unit ceiling, wall, floor, and slab insulation levels meet or exceed values from the Residential chapter or the "Group R" column in the Commercial chapter of the 2009 IECC, or for National v1.2, the 2021 IECC. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
Energy Rating file is consistent with the National Rater Field Checklist	<input type="checkbox"/>	<input type="checkbox"/>	-
1.3 Modeled insulation achieves Grade I install. per ANSI / RESNET / ICC 301. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
3.1, 3.2 & 3.3 Modeled attic insulation meets minimum R-value at perimeter, platforms and attic covers. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 For slabs on grade in CZ 4-8, slab edge modeled with ≥ R-5 insulation at depth of 2 ft., or 4 ft. for heated slabs in CZ 6-8. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5 & 3.6 Modeled concrete floor slabs are consistent with UA requirements or alternatives. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.7 Modeled above grade walls are consistent with documented thermal bridging strategy (3.7.1, 3.7.2 or 3.7.3). <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
6.3 Modeled supply and return ducts in unconditioned space are insulated to R-6. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 & 6.5 Modeled duct leakage is consistent with total leakage and, in townhouses only, leakage to outdoors limits. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.1 Modeled ventilation rate is within ± 15 CFM or ± 15% of dwelling unit design report value (2.7), and meets or exceeds rates required by ASHRAE 62.2-2010. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	-
<b>National Rater Design Review Checklist</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
2.2.1 Rater documentation that installed common space fenestration meets or exceeds ENERGY STAR MF Reference Design Req'ts. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Rater documentation that installed common space ceiling, wall, floor, and slab-on-grade insulation levels meet or exceed 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. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>If Track A – HVAC Grading by Rater was pursued:</b>			
4a.4 Dwelling Units: Total occupant gains do not exceed 645 Btuh per occupant. <sup>2</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 HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4a.7 Common Spaces: Item 2.3 is completed for all required spaces in the building.	<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"/>
<b>If Track B – HVAC Testing by FT Agent was pursued:</b>			
4b.2 National HVAC Design Report(s) reviewed for the following parameters (National MFNC HVAC Design Report Item # indicated in parenthesis):			
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>2</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 the dwelling unit being reviewed and total occupant gains (3.7) do not exceed 645 Btuh per occupant. <sup>2</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 the dwelling unit being reviewed. <sup>2</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 the dwelling unit being reviewed, or for dwelling units to be certified with > 500 sq. ft. of window area, between 3% smaller and 12% larger. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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"/>



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4b.2.8 Non-occupant internal gains (3.13) are less than 3,600 Btuh.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4b.2.9 Sensible & total heat gain are documented (3.15, 3.17) for the orientation of the dwelling unit being reviewed. <sup>2</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"/>	
4b.2.11 Common Spaces: Item 2.8 is completed for all required spaces in the building.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4b.2.12 Common Spaces: Item 2.9 is equal to or greater than Item 2.8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>National Rater Field Checklist</b> As an alternative, complete and attach the National Rater Field Checklist, Version 1 / 1.1 / 1.2 (Rev. 04).	<b>Yes</b>	<b>No</b>	<b>Not Verified</b>	<b>N/A</b>
<b>1. High-Performance Fenestration &amp; Insulation</b>				
1.2 Accessible insulation in dwelling units (ceiling, wall, floor, and slab) and Rater's documentation of insulation matches the energy rating file and meets or exceeds specification in Item 3.1 of the Rater Design Review Checklist. <sup>2</sup>				
3.1.2 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Accessible insulation in common spaces (ceiling, wall, floor, and slab) and Rater's documentation of insulation specifications meets or exceeds levels specified in Item 3.2 of the Rater Design Review Checklist. <sup>2,3</sup>				
3.2 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 All visible insulation achieves Grade I install. per ANSI / RESNET / ICC 301. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Heated plenums in unconditioned space or ambient conditions meet the following requirements: <sup>2</sup>				
1.5.1 Sides of heated plenum are an air barrier and insulated to $\geq R-3ci$ in CZ 1-4; $\geq R-5ci$ in CZ 5-6; $\geq R-7.5ci$ in CZ 7; $\geq R-9.5ci$ in CZ 8, AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5.2 Insulation at top of plenum meets Item 3.6 where applicable. Otherwise, meets or exceeds the R-value for mass floors from the "All Other" column of Table 502.2(1) of 2009 IECC, AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5.3 Bottom of heated plenum has at least R-13 insulation. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Garages with space heating meet the following requirements: <sup>2</sup>				
1.6.1 Insulation on above grade walls and walls on the first story below grade $\geq R-5ci$ in CZ 5-6; $\geq R-7.5ci$ in CZ 7; $\geq R-9.5ci$ in CZ 8, AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6.2 Ceiling insulation meets Item 3.6 where applicable. Otherwise, meets or exceeds the R-value for mass floors from the "All Other" column of Table 502.2(1) of 2009 IECC.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. Reduced Thermal Bridging</b>				
The following items must be verified in the dwelling unit being reviewed and 50% of common spaces where the condition is present:				
3.1 For insulated ceilings with attic space above (i.e., non-cathedralized), Grade I insulation extends to the inside face of the exterior wall below and is $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Insulation beneath attic platforms (e.g., HVAC platforms, walkways) $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5 Visible above-grade and at-grade concrete floor edges (e.g., podiums, balconies) in CZ 4-8, insulated to $\geq R-5$ & aligned with the thermal boundary of the walls. At this boundary, concrete floors resting on mass walls must provide insulation that extends $\geq 8$ ft. below the bottom of the floor edge & for floors resting on columns, the insulation surrounds the column, at a depth of 4ft. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.6 For concrete slab floors in CZ 4-8 above ambient conditions, garages, or unconditioned spaces outside the thermal boundary, accessible floor insulation meets the R-Value used in the UA calculation provided by the Rater. The U-factor documented by the Rater for the UA calculation meets the U-factor in Table 502.1.2 of the 2009 IECC for Group R when dwelling units are above the slab, & 'All Other' when common space is above the slab.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Air Sealing</b>				
The following items must be verified in the dwelling unit being reviewed and 50% of common spaces where the condition is present, to reduce air leakage to exterior, adjacent buildings, or unconditioned spaces:				
4.1 Visible ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and gasketed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions made substantially air-tight with door seal and weatherstripping or equivalent gasket.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8 Attic access panels, roof hatches and drop-down stairs are gasketed (i.e., not caulked) or equipped with durable covers that are gasketed. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The following items must be additionally verified in the dwelling unit being reviewed:				
4.9 Doors serving as a unit entrance from a corridor/stairwell made substantially air-tight with door seal and weatherstripping or equivalent gasket.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10 Reviewer-measured compartmentalization is no greater than 0.30 CFM50 per square feet of dwelling unit enclosure area, following procedures in ANSI / RESNET / ICC 380. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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4.10.1 For dwelling units with forced air distribution systems without ducted returns and air handlers located in a closet or space adjacent to unconditioned space, Reviewer-measured pressure difference between the space containing the air handler and the conditioned space during the compartmentalization test is no greater than 5 Pa. <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5. Heating &amp; Cooling Equipment – Complete Track A-HVAC Grading by Rater or Track B-HVAC Testing by FT Agent</b>		<b>Yes</b>	<b>No</b>	<b>Not Verified</b>	<b>N/A</b>
Track A	5a.1 Blower fan volumetric airflow is Grade I or II per ANSI / RESNET / ACCA 310.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.2 Blower fan watt draw is Grade I or II per ANSI / RESNET / ACCA 310.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.3 Refrigerant charge is Grade I per ANSI / RESNET / ACCA 310. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.4 HVAC manufacturer & model number on installed equipment matches the HVAC Design Report in compliance with ANSI / RESNET / ACCA 310 or the HVAC Design Supplement to Std. 310 for Common Spaces and Central Systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Track B	5b.1 In accordance with the checkbox selected by the Rater, HVAC manufacturer & model number on installed equipment matches either of the following (check box): <sup>2</sup> <input type="checkbox"/> National HVAC Design Report (4.6-4.9 & 4.25-4.26) <input type="checkbox"/> Written approval received from designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
5.6 Heating and cooling eqpt. serving common spaces and garages, but not dwelling units, meet the efficiency levels in the Exhibit X. <sup>2,5</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Equipment Controls</b>					
5.9 All heating and cooling systems serving the dwelling unit have thermostatic controls within the dwelling unit.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.10 Where present, stair and elevator shaft vents are equipped with motorized dampers that are capable of being automatically closed during normal building operation and are interlocked to open as required by fire and smoke detection systems. Dampers are verified to be closed at the time of inspection.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.11 Freeze protection systems, such as heat tracing of piping and heat exchangers, including self-regulating heat tracing, and garage / plenum heaters include automatic controls that are verified to shut off the systems when pipe wall or garage / plenum temperatures are above 40°F.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.11.1 Where heat tracing is installed for freeze-protection, controls must be based on pipe wall temperature and a minimum of R-3 pipe insulation is also required.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.12 Snow- and ice-melting systems include automatic controls that are verified to shut off the systems when the pavement temperature is above 50°F and no precipitation is falling, and an automatic or manual control is installed that is verified to shut off system when the outdoor temperature is above 40°F, so that the potential for snow or ice accumulation is negligible.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Hydronic Distribution Requirements – Applies to heating or cooling systems serving more than one dwelling unit</b>					
5.13 For hydronic distribution systems, all terminal heating and cooling distribution equipment are separated from the riser or distribution loop by a control valve or terminal distribution pump, so that heated or cooled fluid is not delivered to the dwelling unit distribution equipment when there is no call from the thermostat.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.14 In the dwelling unit being reviewed, terminal units in hydronic distribution systems are equipped with pressure independent balancing valves or pressure independent control valves.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.16 For circulating pumps serving hydronic htg. or clg. systems with 3-phase motors, 1 HP or larger, motors meet or exceed efficiency standards for NEMA Premium™ motors. If 5 HP or larger, also installed with VFDs. <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6. Duct Quality Installation</b>					
6.1 In the dwelling unit being reviewed, ductwork installed without kinks, sharp bends, compressions, or excessive coiled flexible ductwork. <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 All bedrooms provided with transfer grilles, jump ducts, dedicated return ducts, and/or undercut doors. Bedrooms with a design supply airflow ≥ 150 CFM (per Item 5.2 on the National HVAC Design Report) achieve a Reviewer-measured pressure differential ≥ -5 Pa and ≤ +5 Pa with respect to the main body of the dwelling unit when all air handlers are operating. Townhouses only: In addition, bedrooms with a design supply airflow < 150 CFM achieve a Reviewer-measured pressure differential ≥ - 3 Pa and ≤ +3 Pa. <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3 All visible supply and return ducts in unconditioned space, including connections to trunk ducts, are insulated to ≥ R-6. <sup>2</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 Reviewer-measured total duct leakage in dwelling unit being reviewed (and common spaces using ANSI / RESNET / ACCA 310) meets one of the following options: <sup>2,5</sup>					
6.4.1 <u>Rough-in</u> : Tested per allowances below, with the air handler & all ducts, building cavities used as ducts, & duct boots installed. In addition, verified <u>all</u> duct boots sealed to finished surface, at final. <sup>2</sup> <u>No ducted returns</u> : <sup>2</sup> The greater of ≤ 3 CFM25 per 100 sq. ft. of CFA or ≤ 30 CFM. Additionally, the Reviewer-measured pressure difference between the space containing the air handler and the conditioned space, with the air handler running at high speed, is ≤ 5 Pa. For systems > 1 ton, increase by 1 Pa per half ton. <u>One or two ducted returns</u> : <sup>2</sup> The greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM. <u>Three or more ducted returns</u> : <sup>2</sup> The greater of ≤ 6 CFM25 per 100 sq. ft. of CFA or ≤ 60 CFM.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# ENERGY STAR Multifamily New Construction

## Quality Control Checklist (ERI Path), v1 / 1.1 / 1.2 (Rev. 04)

6.4.2 <b>Final:</b> Tested per allowances below, with the air handler & all ducts, building cavities used as ducts, duct boots, & register grilles atop the finished surface (e.g., drywall, floor) installed. <sup>2</sup> <b>No ducted returns:</b> <sup>2</sup> The greater of ≤ 6 CFM25 per 100 sq. ft. of CFA or ≤ 60 CFM. Additionally, the Reviewer-measured pressure difference between the space containing the air handler and the conditioned space, with the air handler running at high speed is ≤ 5 Pa. For systems > 1 ton, increase by 1 Pa per half ton. <b>One or two ducted returns:</b> <sup>2</sup> The greater of ≤ 8 CFM25 per 100 sq. ft. of CFA or ≤ 80 CFM. <b>Three or more ducted returns:</b> <sup>2</sup> The greater of ≤ 12 CFM25 per 100 sq. ft. of CFA or ≤ 120 CFM.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5 Townhouses only: Reviewer-measured duct leakage to the outside the greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM25. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7 Duct leakage of central exhaust ductwork serving four or more dwelling units, serving the dwelling unit being reviewed meets one of the following two options:						
6.7.1 <b>Rough-in:</b> Tested including horizontal run outs, trunks, branches, and take-offs up to, but not including, the grilles where the leakage does not exceed 25% of exhaust fan flow. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.7.2 <b>Final:</b> Tested inclusive of all ductwork between the fan and the grilles where the leakage does not exceed 30% of exhaust fan flow. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>7. Dwelling-Unit &amp; Common Space Mechanical Ventilation Systems &amp; Inlets in Return Duct</b>			<b>Yes</b>	<b>No</b>	<b>Not Verified</b>	<b>N/A</b>
7.1 Ventilation manufacturer & model number on installed equipment in the building matches either of the following (check box): <sup>2,5</sup> <input type="checkbox"/> National HVAC Design Report <input type="checkbox"/> Written approval received from designer			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2 Reviewer-measured ventilation rate is within either ± 15 CFM or ±15% of dwelling unit design values (2.7), and meets or exceeds rates required by ASHRAE 62.2-2010. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3 Reviewer-measured ventilation rate is within either ± 15 CFM or ±15% of common space design values (2.9), and meets or exceeds rates required by ASHRAE 62.1-2010. <sup>2,6</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4 A ventilation override control installed and also labeled if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the ventilation equipment). Townhouses only: In addition, the ventilation override control installed must be readily-accessible to the occupant.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5 For any outdoor air inlet connected to a ducted return of the dwelling unit HVAC system (Complete if present; otherwise check "N/A"): <sup>2</sup>			-	-	-	<input type="checkbox"/>
7.5.1 Controls automatically restrict airflow using a motorized damper during vent, off-cycle and occupant override. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.5.2 Reviewer-measured vent. Rate is ≤ 15 CFM or 15% above design value at highest HVAC fan speed. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7 If dwelling-unit Vent System controller operates the dwelling unit HVAC fan, then HVAC fan operation is intermittent and either the fan type is ECM / ICM (4.12), or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.9 If central exhaust fans, ≤ 1 HP, are installed as part of the dwelling-unit mechanical ventilation system, the lesser of 5 or 20% of the installed fans are verified as direct-drive, ECM, with variable speed controllers. If > 1 HP, the lesser of 5 or 20% of the fan motors meet or exceed <a href="#">efficiency standards for NEMA Premium™</a> motors. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.10 Air inlet locations (Complete if air inlet locations were installed (2.22, 2.23); otherwise check "N/A"): <sup>2</sup>			-	-	-	<input type="checkbox"/>
7.10.1 Inlet(s) pull ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
7.10.2 Inlet(s) are ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources not exiting the roof, and ≥ 3 ft. distance from dryer exhausts and sources exiting the roof. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
7.10.3 Inlet(s) are provided with rodent / insect screen with ≤ 0.5 inch mesh.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
<b>8. Local Mechanical Exhaust</b> (National HVAC Design Report Item # indicated in parenthesis)						
<b>Dwelling Unit Mechanical Exhaust</b> – In each dwelling unit kitchen and bathroom, a system is installed that exhausts directly to the outdoors and meets one of the following Reviewer-measured airflow standards: <sup>2</sup>						
<b>Location</b>		<b>Continuous Rate</b>	<b>Intermittent Rate</b> <sup>2</sup>			
8.1 Kitchen	Airflow	≥ 5 ACH, based on kitchen volume <sup>2</sup>	≥ 100 CFM and, if not integrated with range, also ≥ 5 ACH based on kitchen volume <sup>2</sup>			
8.2 Bathroom	Airflow	≥ 20 CFM	≥ 50 CFM			
<b>Mechanical Exhaust for Common Spaces and Shared Garages</b>						
8.3 Reviewer-measured exhaust rates are ≥ ASHRAE 62.1-2010 rates (2c). <sup>2,6</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4 Where a garage exhaust ventilation system is installed, it is equipped with controls that sense CO and NO2.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>9. Filtration</b>						
9.1 In the dwelling unit being reviewed, filter location capable of accepting MERV 6+ filter(s) installed in each ducted mechanical system serving an individual dwelling unit, where all return and mechanically supplied outdoor air passes through filter(s) prior to conditioning, and that facilitates access & regular service by the occupant or building maintenance staff. <sup>2,3</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.1.1 Filter access panel includes gasket and fits snugly against the edge of filter when closed to prevent bypass. <sup>2</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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10. Combustion Appliances	Yes	No	Not Verified	N/A
10.1 Furnaces, boilers, and water heaters located within the building's pressure boundary are mechanically drafted or direct-vented. <sup>2, 5</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 In the dwelling unit being reviewed and all applicable common spaces, fireplaces located within the building's pressure boundary are direct-vented. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3 In the dwelling unit being reviewed and all applicable common spaces, no unvented combustion appliances other than cooking ranges or ovens are located inside the building's pressure boundary. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>11. Domestic Hot Water</b>				
11.2 Hot Water Equipment Min. Efficiency Levels for equipment serving common spaces but not dwelling units nor shared laundry: <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2.1 For non-electric equipment: if rated in EF or UEF, meet the efficiency levels specified in the ENERGY STAR Multifamily Reference Design; if rated in Et ≥85%, or for Nat'l v1.2 ≥90%.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2.2 For electric equipment: ≥ 0.93 UEF, 0.95 EF or 95% Et. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12. Lighting</b>				
12.1 Common Space Lighting Controls:				
12.1.1 At least 50% of common spaces (including shared garages), except the building lobby, mechanical equipment rooms, and where automatic shutoff would endanger the safety of occupants, have occupancy sensors, programmed timers, or automatic bi-level lighting controls installed and operation has been verified. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.2 Exterior lighting controls: Fixtures, including parking lot fixtures, must include automatic switching on timers or photocell controls except fixtures intended for 24-hour operation, required for security, or associated with the electric meter for an individual dwelling unit .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.3 Common Spaces and Garages: For at least 50% of common spaces and garages, 90% of installed lighting fixtures are integrated LED fixtures or contain LED lamps. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.4 In at least 50% of all exterior and common spaces, lighting fixtures meet the efficiency requirements in the ENERGY STAR Multifamily Reference Design, except fixtures located on dwelling unit balconies. <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>13. Appliances, Ceiling Fans, and Plumbing Fixtures</b>				
13.2 Where installed in common spaces, refrigerators and dishwashers are ENERGY STAR certified and showerheads are WaterSense labeled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>14. Whole Building Energy Consumption Data Acquisition Strategy</b>				
14.1 For buildings 50,000 ft and larger, if the strategy involves a meter or other item installed at the location, this device has been confirmed as a strategy that enables the collection of monthly or annual building-level energy consumption data (electricity, natural gas, chilled water, steam, fuel oil, propane, etc.). <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Instructions for Performing Quality Control Review

- This checklist is used to document the quality control review of the items being verified by the Rater in the dwelling units and common spaces of an ENERGY STAR Multifamily New Construction building.
- One checklist shall be used to document all applicable items for one dwelling unit and the common space. Where more than one dwelling unit in a building is being reviewed, additional checklists shall be used for the additional dwelling units, but the common space only needs to be reviewed once per building.
- During File Review, complete the Action Items / Summary of QC, Documentation Collection, Energy Rating File and National Rater Design Review Checklist sections. During Field Review, complete the entire checklist.
- In accordance with the HCO's policies, a limited amount of the required QC Field Reviews may be performed at the pre-drywall stage. Mark items that are not yet installed as "N/A." <sup>1</sup>
- Where a checklist item cannot be verified because it is not visible, not accessible, cannot be tested, or there are other extenuating circumstances, mark the box in the column "Not Verified," and include an explanation in an attached document.
- Additional items may be reviewed at the reviewer's discretion and included in the Additional Checklist Items and Exemptions report below.
- Items found to be out of compliance shall be corrected. If correction is not possible, the building's certification is required to be withdrawn (please contact the HCO for guidance).

## Footnotes

1. Home Certification Organizations (HCOs) are independent organizations recognized by EPA to implement an ENERGY STAR certification program for single-family and multifamily homes and apartments using an Energy Rating Index (ERI) compliance path. Learn more and find a current list of HCOs at [energystar.gov/partner\\_resources/residential\\_new/working/other\\_participants/hco](http://energystar.gov/partner_resources/residential_new/working/other_participants/hco).
2. This item has been edited for space or has a footnote with an exemption or alternative. Refer to referenced program document for details. When an item is properly met using an exemption or alternative, mark the item as "Yes" and record a description in the Additional Checklist Items and Exemptions table.
3. While the QC Reviewer is not required to verify compliance with the insulation requirements in each common space, the QC Reviewer is required to review the ceiling insulation in at least one common space and floor insulation in at least one common space, if applicable.
4. For Items 5b.1, 5.6, 6.3, 6.4, 7.1, and 10.1 while the QC Reviewer is not required to verify compliance for each HVAC and ventilation system installed in the building, the QC Reviewer shall verify compliance for the systems serving the dwelling unit being reviewed and in addition,

