



U.S. DOE Zero Energy Ready Home Multifamily Quality Assurance Checklist (ERI Path) Version 2

A Zero Energy Ready Home Quality Assurance Checklist shall be completed during each quality assurance file review and field review (QA review) of homes being certified through the DOE Zero Energy Ready Home (ZERH) program in accordance with the policies and procedures of the DOE-recognized Home Certification Organization for the Zero Energy Ready Home program (HCO for ZERH). This edition of the QA checklist is mandatory for homes certified under ZERH Multifamily Version 2.

Instructions for Performing Quality Assurance Review

- Instructions for All Reviews:
 - An ENERGY STAR Multifamily New Construction Quality Assurance Review must be completed on the unit in question in order for a Quality Assurance Review for ZERH Multifamily Version 2 to be performed.
 - One checklist shall be used to document all applicable items for one dwelling unit. Where more than one unit in a building is being reviewed, additional checklists shall be used for the additional dwelling units.
 - Items found to be out of compliance, in accordance with the HCO for ZERH policies, shall be corrected. If correction is not possible, the unit's certification is required to be withdrawn (please contact zerh@doe.gov for guidance).
 - Additional items may be reviewed and reported in Table 9: Additional Checklist Items and Exemptions.
- Instructions for File Review:
 - Complete Tables 1 through 8 below, except where marked "For Field Review Only."
- Instructions for Field Review:
 - Complete all items in Tables 1 through 8 below. Complete all File Review items **before** completing "For Field Review Only" items.
 - Where a National Rater 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.
 - In accordance with the HCO for ZERH policies, a limited amount of the required QA Field Reviews may be performed at the pre-drywall stage. Mark items that are not yet installed as "Not Verified." If any items are "Not Verified," attach an action/explanation summary document.



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1. Project Information

Building Address	City	State
Building Name	Number of Units	Permit Date

2. Original Rating Information

Energy Rating Company Name			ZERH Partner Status Confirmed?
			<input type="checkbox"/> Yes <input type="checkbox"/> No
Pre-Drywall Inspection Rater Name	Rater ID #	Date of Pre-Drywall Inspection	Required ZERH training complete at time of inspection?
Final Inspection Rater Name	Rater ID #	Date of Final Inspection	Required ZERH training complete at time of inspection?

3. QA Review Information

QA Reviewer Name	File Review or Field Review?	Date of Review
Rater Being QA'd	Pre-drywall or post-final inspection?	Unit Number
<i>For Field Review Only</i>	Field Review Rater Name	Pre-drywall or post-final inspection?

4. Action Items / Summary of QA

	Yes	No
All items in Tables 5 – 7 are marked “Yes.”		
If any items in Tables 5 – 7 are marked “No” or “Not Verified,” a document explaining these items is attached to this file. (If all items in Tables 5-7 are marked “Yes,” mark N/A.)		



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5. Documentation Collection

All items below must be collected as part of the QA data file for <u>both file and field reviews</u> .		Yes	No
A	Energy rating file (model).		
B	Documentation that the builder is a ZERH Partner. If documentation of active partnership cannot be verified, contact zerh@doe.gov.		
C	Documentation that the building is certified under ENERGY STAR Multifamily New Construction Version 1.2.		
D	Documentation that the building is certified under EPA Indoor airPLUS. (Required version determined by permit date).		
E	DOE Zero Energy Ready Home Multifamily PV-Ready Checklist Version 2 is collected, with all applicable items marked "Verified," or the building meets an exemption or alternative as specified in the National Program Requirements (see Table 8, below).		
F	DOE Zero Energy Ready Home Multifamily National Rater Checklist Version 2 is collected, with no items left blank or marked "Must Correct."		
G	DOE Zero Energy Ready Home Multifamily EV-Ready Checklist Version 2 is collected, with all applicable items marked "Verified," or the building meets an exemption or alternative as specified in the National Program Requirements (see Table 8, below).		
H	Unique identifier (when available from DOE) for ZERH certification is recorded on the dwelling unit's ZERH certificate.		
I	Photo documentation is collected that complies with the Rater's HCO for ZERH's documentation requirements.		

6. Energy Rating File (Model) Review

All items below must be verified as part of the QA process for <u>both file and field reviews</u> .		Yes	No
J	Energy rating file (model) passes the HCO for ZERH's quality assurance review checklist.		
K	ERI of the modeled unit meets or exceeds the DOE ZERH ERI Target for the applicable program version.		
L	Energy rating file (model) is consistent with the National Rater Checklist (see items 3.1 – 7.2 below).		
3.1a	Modeled whole building thermal envelope total UA is equal to or lower than the UA value calculated as the sum of each envelope assembly component multiplied by its respective U factor from the 2021 IECC as specified in the National Program Requirements. Note that a dwelling unit UA calculated by ERI software does not demonstrate compliance with the ZERH requirement for a <i>whole-building UA</i> . See the National Program Requirements for details.		
3.2	Dwelling unit's modeled windows meet the high-performance requirements based on climate zone.		
4.1	Dwelling unit's in-unit heating and cooling distribution ducts and heating and cooling air handling equipment are modeled as located within the thermal and air barrier boundary or meet an alternative as specified in the National Program Requirements (see Table 8, below).		



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5.1	Dwelling unit's domestic hot water fixtures are modeled as low-flow (if software allows).		
5.3	In-dwelling unit recirculation systems, if present, are modeled with on-demand controls.		
5.4	Central recirculating hot water distribution systems serving the dwelling unit, if present, is modeled to meet pipe insulation thickness criteria as specified in the National Program Requirements (if software allows).		
6.2	Modeled lighting is at least 95% LEDs.		
7.2	If the project is located in 2021 IECC Climate Zones 6-8, dwelling unit is modeled with energy efficient balanced ventilation that meets or exceeds 65% SRE (@32 °F) and 1.2 CFM/Watt or meets an alternative as specified in the National Program Requirements (see Table 8, below). If the project is located in 2021 IECC Climate Zones 1-5, mark this item as "N/A."		

7. DOE Zero Energy Ready Home Multifamily National Rater Checklist Review

All items below must be verified as part of the QA process <u>for both file and field reviews</u> .		Yes	No
M	Rater name(s) is/are recorded.		
N	Rater inspection dates are recorded.		
O	Rater signature(s) is/are recorded.		
All items below must be verified, with applicable documentation collected, as part of the QA process <u>for field reviews only</u> . As an alternative, complete and attach the DOE Zero Energy Ready Home Multifamily National Rater Checklist.		Not Verified	Yes No
P	As-built home is consistent with the National Rater Checklist and Energy Rating File (Model) (see items 3.1 – 11.1, below).		
3.1	Insulation which is accessible for inspection matches the corresponding insulation value used in the energy rating file (model).		
3.2	U and SHGC values of windows in rated unit match corresponding values in the energy rating file (model).		
4.1	All accessible heating and cooling distribution ducts and heating and cooling air-handling equipment within the dwelling unit are located within the thermal and air barrier boundary, or meet an alternative as specified in the National Program Requirements (see Table 8, below).		
5.1	Installed water heater efficiency matches corresponding efficiency value used in the energy rating file (model), and installed showerheads and bathroom sink faucets and aerators which are accessible for inspection are WaterSense labeled. WaterSense label can be verified using the item's serial number (if available) if the fixture's label has been removed since installation.		
5.2	Hot water delivery systems within the dwelling unit meet stored volume criteria based on a review of submitted construction documents. If compliance cannot be determined based on a review of construction documents, mark this item "not verified."		
5.3	In-dwelling unit recirculation systems, if present, use on-demand controls.		



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5.4	Piping which is part of a central recirculating hot water distribution system and that is accessible for inspection matches the corresponding insulation value used in the energy rating file (model).			
6.1	All builder-supplied and builder-installed in-dwelling refrigerators, dishwashers, clothes washer, and clothes dryers are ENERGY STAR certified <i>or</i> all builder-supplied and builder-installed in-dwelling dishwashers, clothes washers, and clothes dryers are ENERGY STAR certified and the exemption for a non-ENERGY STAR refrigerator noted in the National Program Requirements is used.			
6.2	100% of builder-installed lighting fixtures and lamps (bulbs) within the dwelling unit are LEDs or the lighting meets an alternative as specified in the National Program Requirements (see Table 8, below).			
6.3	All installed bathroom ventilation fans in dwelling units are ENERGY STAR certified.			
7.2	Installed energy efficient balanced ventilation (HRV or ERV) matches the corresponding efficiency values in the energy rating file (model). If no balanced ventilation system is present in the unit, mark this item "N/A."			
8.1	Provisions of the DOE Zero Energy Ready Home Multifamily PV-Ready Checklist marked as "Verified" are present in the rated building or the project meets an alternative as specified in the Multifamily PV-Ready Checklist.			
9.1	Provisions of the DOE Zero Energy Ready Home Multifamily EV-Ready Checklist marked as "Verified" are present in the rated building or the project meets an alternative as specified in the Multifamily EV-Ready Checklist.			
10.1	a. Individual branch circuit outlet is installed, energized, and terminates within 3 feet of each installed fossil fuel water heater in a dwelling unit, or the water heater meets an alternative as specified in the National Program Requirements (see Table 8, below).			
	b. A volume of open space that is at least 3' x 3' wide and 7' high is located within the dwelling unit surrounding or within 3 feet of the installed fossil fuel water heater in the dwelling unit, or the water heater meets an alternative as specified in the National Program Requirements (see Table 8, below).			
10.2	Dwelling units with in-unit water heaters have a condensate drain installed within three feet of existing water heater. If dwelling unit is served by a central domestic hot water system, mark this item "N/A."			
11.1	For dwelling units with in-unit combustion space heaters, individual branch circuit outlet or conduit is installed to facilitate future wiring for a heat pump installation. Circuit or conduit is labeled as "For future heat pump." Or, the space conditioning equipment meets an alternative as specified in the National Program Requirements (see Table 8, below).			

8. DOE Zero Energy Ready Home Multifamily Rater Checklist Exemptions and Alternatives

Mark any exemptions or alternatives used during the original rating.		Yes	No
3.1	Slab edge insulation allowance for jurisdictions designated as having Very Heavy Termite Infestation.		



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	ENERGY STAR insulation allowances, exceptions, and compliance alternatives (e.g., for slab edge (above-grade and on-grade), columns, balcony details) recognized by the most recent national version and revision of ENERGY STAR Multifamily New Construction (ESMFNC) are used.		
3.2	Windows are exempted from U/SHGC requirements because they are utilized as part of a passive solar design.		
	Windows are permitted to meet different U values based on climate zone and project site elevation.		
	Class AW windows are included in the area-weighted window calculation and meet U/SHGC requirements noted in the National Program Requirements.		
4.1	Distribution ducts and/or heating and cooling air-handling equipment serves multiple dwelling units or is not located in the rated unit.		
6.2	Up to 5% of lighting, for task or decorative lighting, is not LED lighting. The remaining builder-installed lighting is LED.		
7.2	The dwelling unit is served by a centralized HRV or ERV.		
10.1	a. Dwelling unit utilizes an electric water heater or is served by a central water heating system.		
	b. Dwelling unit utilizes an electric water heater, is served by a central water heating system, or utilizes a tankless water heater system.		
11.1	The installed primary heating system for the dwelling unit is electric or the dwelling unit is served by a central heating system.		

9. Additional Checklist Items and Exemptions

Use this space to list additional items reviewed and describe any other exemptions or alternatives that were used (attach additional pages, if needed).		
Checklist/Section Name	Item #	Notes