Note: This is a draft of a work in progress for the purposes of stakeholder feedback. There may be errors with formatting, numbering, etc. Additional information will also be available online, when the website for this program is posted.

Eligibility Requirements

The following multifamily building types are eligible to earn-participate in the ENERGY STAR Multifamily New Construction program:

- Any multifamily building with dwelling or sleeping units ¹-that is NOT a two-family dwelling ¹or townhouse; AND
- Mixed-use buildings, whereIs >50% dwelling units and common space exceed 50% of the building square footage. Parking garage square footage is excluded from this calculation ²; ORAND
- Townhouses, if following the requirements listed in Footnote 3. 3 2

Townhouses are also eligible to earn the ENERGY STAR through the ENERGY STAR Certified Homes program, which is a certification program for Townhouses that are attached to eligible multifamily buildings may go through the HERS Path of the Multifamily New Construction program as long as the whole project goes through the Multifamily New Construction program. The Townhouses will still be modeled to Exhibit 1 of the ENERGY STAR Certified Homes National Program Requirements.

Dwelling units in multifamily buildings that are not eligible to earn the ENERGY STAR through the Multifamily New Construction Program may be eligible through the Certified Homes Program. Additionally, some dwelling units in multifamily buildings that are eligible through the Multifamily New Construction Program may also be permitted to earn the ENERGY STAR through the Certified Homes Program.³—single family detached homes and two-family dwellings.¹—For more information, visit: www.energystar.gov/newhomeshttp://www.energystar.gov/newhomesrequirements. In addition, multifamily buildings with permit dates prior to January 1, 2021, may be eligible to earn the ENERGY STAR through the Certified Homes or Multifamily High Rise programs. For more information, visit: www.energystar.gov/mfhr/eligibility.[Note: Website will be updated based on the new program]

Note that <u>multifamily buildings in California shall follow the California Program Requirements</u>, <u>not these National Program Requirements</u>. Also note that compliance with these requirements is not intended to imply compliance with all local code requirements that may be applicable to the building to be built. 45

Partnership, Training, and Credentialing Requirements

Builders, Developers, Raters, ASHRAE Path Modelers, and <u>Functional Testing Agents (""FT Agents")</u> must meet the following requirements prior to certifying multifamily <u>projects buildings</u>:

- The Builder or Developer for the project is required to sign an ENERGY STAR Partnership Agreement and complete the online "Builder_Developer Orientation", which can be found at www.energystar.gov/mfncPA. [Note: Orientation will be updated to include information about the new program, but will be combined with the homes requirements]
- FT Agents must meet one of the following:
 - The HVAC installing contractor AND credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight
 Organization (H-QUITO). An explanation of this process can be found at
 www.energystar.gov/credentialedHVAC; OR
 - Not the HVAC installing contractor, AND
 - Signed up online in EPA's online database as an FT Agent and watched the online FT Agent video-orientation, which
 <u>can be found at www.energystar.gov/mftrainingfNote: will be created for new program and will be similar to the current
 process for builders]: AND
 </u>
 - Meets one of the following: <u>aA</u> Certified Commissioning Professional (CCP), a Certified Building Commissioning Professional (CBCP), a Building Commissioning Professional (BCxP, formerly the Commissioning Process Management Professional (CPMP)), a NEBB Certified Technician (BSC CxCT) or Certified Professional (BSC CP or CxPP), or a representative of the Original Equipment Manufacturer (OEM).
- Raters ⁵⁰/₂ are required to complete training, which can be found at
 <u>www.energystar.gov/newhomestrainingwww.energystar.gov/mftraining</u>. [Note: Will be updated for the new program. The
 transition time for Raters to have completed this training is TBD]
- Modelers for projects buildings in the ASHRAE Path must sign up online in EPA's online database as a Modeler and watch the
 online Modeler orientation which can be found at www.energystar.gov/mftraining. [Note: will be created for new program
 and will be similar to the current process for builders]

ENERGY STAR Certification Process 67

- 1. The certification process offers three paths to meet the performance target. Each has varying levels of flexibility to select a custom combination of measures for each building:
 - a. The Prescriptive Path: The units and common areas spaces meet all the prescriptive items in the National Rater Field Checklist which align with the minimum requirements set in the ENERGY STAR Multifamily Reference Design, Exhibit 1. As described in Exhibit 3, projects buildings in states that have adopted the residential 2012, 2015, or 2018 IECC, or an equivalent code will follow Version 1.1 of the Reference Design, buildings in Oregon (OR) and Washington (WA) will follow the OR and Washington Version 1.2 of the Reference Design, otherwise projects buildings will follow Version 1.0. [Note: CA, WA and OR Version 1.2 regional requirements are under development]



Draft-National Program Requirements

ENERGY STAR Multifamily New Construction, Version 1.0/_1.1/OR-WA 1.2

b. The HERS_ERI_Path: Each unit is equivalent in performance to the minimum requirements of the ENERGY STAR Multifamily Reference Design, Exhibit 1, as assessed through energy modeling, and the common spacesareas meet the prescriptive requirements in the National Rater Field Checklist which align with the minimum requirements set in Exhibit 1. As described in Exhibit 3, projects-buildings in states that have adopted the residential 2012, 2015, or 2018 IECC, or <a href="mailto:an equivalent code will follow Version 1.1 of the Reference Design, buildings in OR and WA will follow the Oregon and WashingtonOR and WA Version 1.2 of the Reference Design, otherwise projects-buildings will follow Version 1.0. [Note: CA, WA and OR Version 1.2 regional requirements are under development]

Projects must use a <u>software rating toolRESNET-accredited Home Energy Rating software program approved by an EPA-Approved Verification Oversight Organization (VOO) to determine the ENERGY STAR HERS IndexERI Target, which is the highest <u>numerical HERS IndexERI</u> value that each rated unit may achieve to earn the ENERGY STAR. 78</u>

Note: The ERI path is not available to buildings that exceed 5 stories, until the EPA-Approved VOO adopts ANSI / RESNET / ICC Std. 301-2019.

c. The ASHRAE (and Title 24 for California) Path: The building meets the ASHRAE/Title-24 performance target, which is dependent on the commercial state energy code and beaseline chosen, as described in Exhibit 4.

Projects must follow the <u>modeling</u> requirements in the ENERGY STAR Multifamily Simulation Guidelines. [Note: The MFHR Simulation Guidelines will be updated for the new program]

All ENERGY STAR certifications are subject to the oversight of a Multifamily Oversight Organization which include Verification Oversight Organizations (VOOs) or a Multifamily Review Organizations (MROs). All ERIHERS Path projects must be overseen by a VOO (e.g., RESNET) and all ASHRAE and Prescriptive Path projects must be overseen submitted to by an MRO. MRO information can be found at energystar.gov/mro.

- Based on the path chosen, Sselect the efficiency measures for the building:
 - a. Prescriptive Path: Meet the prescriptive requirements specified in the National Rater Design and Field Checklists.
 - b. <u>ERIHERS</u> Path: <u>Meet the prescriptive requirements specified in the National Rater Design and Field Checklists for common spaces.</u> Using the same software program specified in Step 1, configure the preferred set of efficiency measures for the unit to be certified and verify that the resulting <u>HERS IndexERI</u> meets or exceeds the ENERGY STAR <u>HERS IndexERI</u> Target, as determined in Step 1. <u>Meet the common area to meet the prescriptive common area measures.</u>
 - c. ASHRAE Path: Following the Simulation Guidelines, configure the preferred set of efficiency measures for the building to be certified and verify that the resulting savings above the ASHRAE Baseline Building meets or exceeds the required performance target per Exhibit 4.

Note that, regardless of the path chosen or the measures selected, the Mandatory Requirements for All Certified Multifamily Projects in Exhibit 2 are also required and impose certain constraints on the efficiency measures selected (e.g., insulation levels, insulation installation quality, window performance, duct leakage). Furthermore, on-site power generation may not be used to meet the ENERGY STAR HERS IndexERI Target or the performance target in the ASHRAE Path.

- 3. Upon completion of design, multifamily buildings may be eligible for the Designed to Earn the ENERGY STAR designation. To earn this optional additional designation, follow the guidance available at www.energystar/gov/mfdees.
- 4. Upon completion of design, for ASHRAE and Prescriptive Path projects only, specific documentation must be submitted to an MRO for their review and approval. These documents include the Performance Path Calculator, the Multifamily Workbook, construction documents, and for ASHRAE projects, either the modeling file or input and output files. MROs may choose to implement alternative design review requirements.
- 3.5. Construct the building using the measures selected in Step 2 and the Mandatory Requirements for All Certified Multifamily Projects, Exhibit 2.
- 4.6. Using a Rater, verify that all requirements have been met in accordance with the Mandatory Requirements for All Certified Multifamily Projects and with the ResNET's_oOn-Ssite Inspection Porcedures for mMinimum rate Rater is required to keep electronic or hard copies of the completed and signed Rater checklists, the HVAC Design Report and, when the FT Agent is not a HVAC Credentialed Contractor, the HVAC Functional Testing Checklist.

The Rater must review all items on the <u>National</u> Rater checklists. Raters are expected to use their experience and discretion to verify that the overall intent of each inspection checklist item has been met (i.e., identifying major defects that undermine the intent of the checklist item versus identifying minor defects that the Rater may deem acceptable).

In the event that a Rater finds an item that is inconsistent with the intent of the checklists, the project cannot earn the ENERGY STAR until the item is corrected. If correction of the item is not possible, the project cannot earn the ENERGY STAR. and individual units in the multifamily project also cannot be certified. In the event that an item on a National Rater checklist cannot be inspected by the Rater, the project also cannot earn the ENERGY STAR. The only exceptions to this rule are in the Thermal Enclosure System Section of the National Rater Field Checklist, where the builder may assume responsibility for verifying a maximum of eight items and the sections on the National Rater Field Checklist where a Licensed Professional may assume responsibility for verifying the specified items. A Licensed Professional must be a Professional Engineer or Registered Architect in good standing and possess a current license. This option shall only be used at the discretion of the Rater. When exercised, the builder's and/or Licensed Professionals' responsibility will be formally acknowledged by the builder and/or Licensed Professional signing the checklist for the item(s) that they verified.

In the event that a Rater is not able to determine whether an item is consistent with the intent (e.g., an alternative method of meeting a checklist requirement has been proposed), then the Rater shall consult their Provider or MRO. If the Provider or MRO



also cannot make this determination, then the Rater, Provider, or MRO shall report the issue to EPA prior to project completion at: energystar.govmfnc@energystar.gov [new email TBD]—and will typically receive an initial response within 5 business days. If EPA believes the current program requirements are sufficiently clear to determine whether the intent has been met, then this guidance will be provided to the partner and enforced beginning with the building in question. In contrast, if EPA believes the program requirements require revisions to make the intent clear, then this guidance will be provided to the partner but only enforced for buildinghome permitted after a specified transition period after the release of the revised program requirements, typically 60 days in length.

This process will allow EPA to make formal policy decisions as partner questions arise and to disseminate these policy decisions through the periodic release of revised program documents to ensure consistent application of the program requirements.

- 7. Upon completion of construction, the Rater is required to keep electronic or hard copies of the completed and signed National Rater checklists, the National HVAC Design Report and, when the FT Agent is not a HVAC Credentialed Contractor, the National HVAC Functional Testing Checklist. Additionally, the following steps are required:
 - a. ERI Path: register each unit in the building / project with the same EPA-Approved VOO.
 - b. ASHRAE and Prescriptive Path: specific documentation must be submitted based on as-built conditions to an MRO for their review and approval. These documents include the Performance Path Calculator, the Multifamily Workbook, construction documents, photo documentation, and for ASHRAE projects, either the modeling file or input and output files.

Exhibit 1: ENERGY STAR Multifamily Reference Design 9

The ENERGY STAR Multifamily Reference Design is the set of efficiency features modeled to determine the ENERGY STAR HERS IndexERI Target for each unit pursuing certification. Therefore, while the features below are not mandatory in the units for projects pursuing the HERS-ERI Path, if they are not used then other measures will be needed to achieve the ENERGY STAR ERIHERS Index Target. In addition, note that the Mandatory Requirements for All Certified Multifamily Projects, Exhibit 2, contain additional requirements such as total duct leakage limits, minimum allowed insulation levels, and minimum allowed fenestration performance. Therefore, EPA recommends that partners review the documents in Exhibit 2 prior to selecting measures.

For projects pursuing the Prescriptive Path, the following features are mandatory within the units and, as specified in the <u>National</u> Rater and Field Checklists, in the common <u>areasspaces</u>. For projects pursuing the <u>ERIHERS</u> Path, the following features are mandatory within the common <u>areasspaces</u> as specified in the <u>National</u> Rater Design and Field Checklists.

This Exhibit is not applicable for projects pursuing the ASHRAE/Title 24 Path.

Common Area Space Applicability Notes:

When using the Reference Design for common area-space measures as specified in the National Rater Design and Rater Field Checklist, the following notes apply.

- 1) Heating and Cooling efficiencies for additional equipment are available in the Exhibit X of the National Rater Field Checklist.
- 2) Insulation levels for common spaces in Version 1 and Version 1.1 are not the values shown in the Reference Design. They must instead meet or exceed the levels in the 2009 and 2012 IECC Commercial chapter, respectively. Tof the year specified in the Reference Design, but the required values should come from the "All Other" column and the row that corresponds to the building assembly (e.g., a building with steel-frame walls would use the value in the 'Metal framed' row).
- 3) Windows are to meet or exceed the requirements specified for "Class AW" windows in the Reference Design_
- 4) All exterior and common area-space lighting fixtures are still subject to the efficiency requirements, even though they are not in 'RESNET-defined Qualifying Light Fixture Locations'. Therefore, 90% of all exterior and common area-space fixtures must be ENERGY STAR certified or meet the alternatives defined in the ENERGY STARNational Rater Field Checklist. This requirement applies to exterior lighting fixtures that are attached to the building, but does not apply to landscape or parking lot lighting fixtures.
- 4)5) Where an appliance type is not eligible for ENERGY STAR certification, (e.g., commercial dryers) the appliance is exempt from this requirement. Where a bathroom faucet or aerator is not eligible for WaterSense certification, (e.g., public use lavatory faucets) the fixture is exempt from this requirement.

ENERGY STAR Multifamily New Construction, Version 1.0_/_1.1/OR-WA 1.2

ENERGY STAR Multifamily Reference Design, Version 1.0 (See Exhibit 3 for where this is applicable)

not Climates (2009 IE)	CC Zones 1,2,3) 910			Mixed	and Cold Cli	mates (2009	IECC Zones	4,5,6,7,8) ¹⁰⁹	.
Cooling Equipment (Where Prov	rided)								
Cooling equipment modeled as	t the applicable efficie	ency levels	below_11:						
• 14.5 SEER / 12 EER AC,			• 13 SEE	R AC,					
Heat pump (See Heating Equipment)			Heat put	ımp (See	Heating Equi	pment)			
Heating Equipment									
Heating equipment modeled a	at the applicable effic	iency level	s below, dep	endent or	fuel and sys	stem type 11:			
80 AFUE gas furnace,			• 90 AF	UE gas fu	rnace.				
80 AFUE oil furnace,				Ū	GY STAR oi	l furnace,			
 80 AFUE boiler, 					GY STAR bo				
• 8.2 HSPF / 14.5 SEER / 12 EE	ER air-source heat pu	mp with	 Heat p 	oump, with	efficiency a	s follows:			
electric or dual-fuel backup			• CZ 4: 8	3.5 HSPF	/ 14.5 SEER	/ 12 EER air-	source w/ ele	ctric or dual-	fuel backup
			• CZ 5: 9	9.25 HSPF	7 / 14.5 SEEF	R / 12 EER aiı	r-source w/ el	ectric or dua	l-fuel backı
						/ 12 EER air-			
			• CZ 7-8:	3.5 COP	/ 16.1 EER (ground-source	w/ electric or	r dual-fuel ba	ickup
Envelope, Windows, & Doors									
 A radiant barrier modeled if moductwork are located in an unclean 		t of	No radia	ant barriei	modeled.				
Insulation levels modeled to 20	009 IECC levels (Con	nmercial, v	vood-frame)	and Grad	e I installatio	n per <u>ANSI / F</u>	RESNET / ICC	C Standard 3	01RESNE
standards. 11, 12 Climate Zone:		CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8
Slab Insulation R-Value:		0	0	0	10	10	15	15	20
Slab Insulation Depth (ft):		0	0	0	2	2	2	2	2
Basement Wall Continuous Ins Floor Assembly U-Factor:	sulation R-Value:	0 0.282	0 0.052	0 0.033	7.5 0.033	7.5 0.033	7.5 0.033	10 0.033	12.5 0.033
Wall Assembly U-Factor:		0.282	0.032	0.033	0.033	0.053	0.053	0.053	0.036
Ceiling Assembly U-Factor:		0. <u>027</u> 60	<u>0.027</u> 0.60 <u>0</u>).027 <mark>0.35</mark>	<u>0.027</u> 0.32	<u>0.027</u> 0.30	0.0270.30	<u>0.027</u> 0.30 <u>0</u>	<u>).027</u> 0.30
 Infiltration rates modeled as fo 		ft ² of enclo	sure						
Windows and doors modeled, Note: 1.1.			0.05: 07.	•		0: 07.4	2.22	. 07 10 5	
Window U- <u>Factor</u> Value:	0.60 in CZs 1,2		0.35 in CZ :	3	0.3	2 in CZ 4	0.30	in CZs 4 C,5	5,6,7,8
Window SHGC:	0.27 in CZs 1,2		0.30 in CZ	3	0.4	0 in CZ 4	Any	in CZs 4 C,5	,6,7,8
Door U- Factor value :	Opaque: 0.21			≤½ lite	: 0.27		>1/2	lite: 0.32	
	Opaque: Any			≤½ lite	. 0.20		- 1/	lite: 0.30	
I Door CHCC:						\	>/2	iile. 0.30	
Door SHGC:		lovale (Car	mmorcial win	AOW II Ea	ctor\/alua ra				CZ 8
Exception: Class AW windows mo	odeled to 2012 IECC						C7 6	C7 7	0– 0
Exception: Class AW windows mo Climate Zone: Fixed Window U-FactorValue:	odeled to 2012 IECC CZ 0.50	1 CZ	2 CZ 3	CZ	4 (CZ 4 C & 5 0.38	CZ 6 0.36	CZ 7 0.29	0.29
Exception: Class AW windows mo Climate Zone: Fixed Window U- <u>Factor</u> Value: Operable Window U- <u>Factor</u> Value	odeled to 2012 IECC CZ 0.50 0.69	1 CZ 0 0.5 5 0.6	2 CZ 3 0 0.46 5 0.60	0.3 0.4	38 15	0.38 0.45	0.36 0.43	0.29 0.37	0.37
Exception: Class AW windows mo Climate Zone: Fixed Window U-FactorValue:	odeled to 2012 IECC CZ 0.50	1 CZ 0 0.5 5 0.6	2 CZ 3 0 0.46 5 0.60	0.3 0.4	38 15	CZ 4 C & 5 0.38	0.36	0.29	
Exception: Class AW windows mo Climate Zone: Fixed Window U- <u>FactorValue</u> : Operable Window U- <u>FactorValue</u> : SHGC (same as above)	odeled to 2012 IECC CZ 0.50 0.69	1 CZ 0 0.5 5 0.6	2 CZ 3 0 0.46 5 0.60	0.3 0.4	38 15	0.38 0.45	0.36 0.43	0.29 0.37	0.37
Exception: Class AW windows mo Climate Zone: Fixed Window U- <u>FactorValue</u> : Operable Window U- <u>FactorValue</u> : SHGC (same as above)	odeled to 2012 IECC CZ 0.56 0.68 0.22	1 CZ 0 0.5 5 0.6 7 0.2	2 CZ 3 0 0.46 5 0.60 7 0.30	0.3 0.4 0.4	38 15	0.38 0.45	0.36 0.43	0.29 0.37	0.37
Exception: Class AW windows mo Climate Zone: Fixed Window U-FactorValue: Operable Window U-FactorValue SHGC (same as above) Water Heater DHW equipment modeled with	odeled to 2012 IECC CZ 0.56 0.69 0.22	1 CZ 0 0.5 5 0.6 7 0.2	2 CZ 3 0 0.46 5 0.60 7 0.30	0.3 0.4 0.4	4 (38 45 40	0.38 0.45 0.40	0.36 0.43 0.40	0.29 0.37 <u>any</u> 0.40	0.37 <u>any</u> 0.40
Exception: Class AW windows model Climate Zone: Fixed Window U-Factor Value: Operable Window U-Factor Value SHGC (same as above) Water Heater DHW equipment modeled with Gas: ≤55 Gal = 6	odeled to 2012 IECC CZ 0.50 0.60 0.2	1 CZ 0 0.5 5 0.6 7 0.2 ncy levels a	2 CZ 3 0 0.46 5 0.60 7 0.30 as applicable 68 UEF, high	0.3 0.4 0.4	38 45 40 >55 Gal = 0	0.38 0.45 0.40 0.47	0.36 0.43 0.40	0.29 0.37 <u>any</u> 0.40	0.37 any0.40 high-draw)
Exception: Class AW windows mo Climate Zone: Fixed Window U-FactorValue: Operable Window U-FactorValue SHGC (same as above) Water Heater DHW equipment modeled with	odeled to 2012 IECC CZ 0.56 0.69 0.22	1 CZ 0 0.5 5 0.6 7 0.2 ncy levels a	2 CZ 3 0 0.46 5 0.60 7 0.30 as applicable 68 UEF, high	0.3 0.4 0.4	38 45 40 >55 Gal = 0	0.38 0.45 0.40 0.40 0.77 EF (0.78 I	0.36 0.43 0.40 UEF, medium	0.29 0.37 <u>any</u> 0.40 i; 0.80 UEF,	0.37 any0.40 high-draw)
Exception: Class AW windows model Climate Zone: Fixed Window U-Factor Value: Operable Window U-Factor Value SHGC (same as above) Water Heater DHW equipment modeled with Gas: ≤55 Gal = 6	odeled to 2012 IECC CZ 0.50 0.60 0.2	1 CZ 0 0.5 5 0.6 7 0.2 ncy levels a	2 CZ 3 0 0.46 5 0.60 7 0.30 as applicable 68 UEF, high	0.3 0.4 0.4	38 45 40 >55 Gal = 0	.77 EF (0.78 I	0.36 0.43 0.40 UEF, medium F or UEF 60-4 Gal = 2.00 El	0.29 0.37 <u>any</u> 0.40 i; 0.80 UEF, Gal = 2.00 E	0.37 any0.40 high-draw)
Exception: Class AW windows mo Climate Zone: Fixed Window U-Factor Value: Operable Window U-Factor Value SHGC (same as above) Water Heater • DHW equipment modeled with Gas: ≤55 Gal = 6	odeled to 2012 IECC CZ 0.56 0.69 0.22 1 the following efficier 0.67 EF (0.64 UEF, n ≤55 Gal = 0.95 I	1 CZ 0 0.5 5 0.6 7 0.2 ncy levels a nedium; 0. EF (0.93 U	2 CZ 3 0 0.46 5 0.60 7 0.30 as applicable 68 UEF, high	0.3 0.4 0.4 0.4	38 45 40 >55 Gal = 0	0.38 0.45 0.40 0.40 0.77 EF (0.78 I 5 Gal = 2.0 E	0.36 0.43 0.40 UEF, medium	0.29 0.37 <u>any</u> 0.40 i; 0.80 UEF, Gal = 2.00 E	0.37 any0.40 high-draw)

Thermostat & Ductwork

- Programmable thermostat modeled.
- Supply ducts in unconditioned attics modeled with R-8 insulation; all other ducts in unconditioned space modeled with R-6 insulation.
- Duct leakage to outdoors modeled at the greater of ≤ 4 CFM25 per 100 ft²sq. ft. of conditioned floor area or ≤ 40 CFM25.

Lighting, Appliances & Fixtures

- ENERGY STAR refrigerators, dishwashers, clothes washers, clothes dryers, and ceiling fans modeled.
- ENERGY STAR light bulbs or fixtures modeled in 90% of ANSI / RESNET / ICC Standard 301 RESNET defined Qualifying Light Fixture Locations. 12
- WaterSense bathroom faucets, bathroom aerators, and showerheads. 11

ENERGY STAR Multifamily Reference Design, Version 1.1 (See Exhibit 3 for where this is applicable)

	Hot Clima	ates (2009 IECC	C Zones 1,2,	3) * <u>10</u>			Mixed a	nd Cold Clim	nates (2009 IE)	CC Zones	s 4,5,6,7,8) ⁹	<u>10</u>
Cooli	ng Equipment	(Where Provid	led)									
• C	cooling equipme	ent modeled at th	he applicabl	e efficie	ncy levels	below_11:						
	5 SEER / 12 EE				-		13 SEER	AC,				
Heat pump (See Heating Equipment)						leating Equip	ment)					
Heat	ing Equipment	t										
• l	Heating equipm	ent modeled at	the applicab	le efficie	ency leve	s below, dep	endent on	fuel and syst	em type_11:			
• G	as furnace, effi	ciency as follow	/S:			• CZ 4-8:	95 AFUE	ENERGY ST	AR gas furnace	9,		
	• CZ 1-3: 80	AFUE,				• 85 AFU	E ENERG	Y STAR oil fu	rnace,			
• 8	0 AFUE oil furn	ace,				• 90 AFUI	E ENERG	Y STAR gas I	ooiler,			
• 8	0 AFUE boiler,					• 86 AFU	E ENERG	Y STAR oil bo	oiler,			
		EER / 12 EER a	air-source he	at pump	o with	 Heat pu 	mp, with e	fficiency as fo	ollows:			
е	lectric or dual-fu	uel backup				• CZ 4:	8.5 HSPF	/ 15 SEER / [/]	12 EER air-sou	rce w/ ele	ectric or dual	-fuel backu
						• CZ 5:	9.25 HSPI	F / 15 SEER /	12 EER air-so	urce w/ e	lectric or dua	al-fuel back
									12 EER air-sou			
						• CZ 7-8:	3.6 COP /	17.1 EER gro	ound-source w	electric d	or dual-fuel b	oackup
Enve	elope, Windows	s. & Doors										
	• ′	modeled to 201.	2 IECC lave		moreial	wood frama)	and Grade	Linetallation	por ANGI / DE	CNET / IC	CC S standa	rde 201 11,
						voou-irame)	and Grade	e i installation	bei VIVOI / KE	SINE I / IC	<u>JC S</u> sianda	10 <u>8 301</u> .
		modeled to 201	2 IECC leve	els (Com				C7 4	C7 4 C 9 E	C7 6	C7.7	C7 0
Clin	nate Zone:		2 IECC leve	els (Com	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8 20
Clin Slat		Value:	2 IECC leve	els (Com				CZ 4 10 2	CZ 4 C & 5 10 2	CZ 6 15 2	CZ 7 15 2	CZ 8 20 2
Clin Slak Slak Bas	nate Zone: o Insulation R- o Insulation De ement Wall Co	Value: epth (ft): ontinuous Insul		·	CZ 1 0 0 0	CZ 2 0 0 0	CZ 3 0 0 0	10 2 7.5	10 2 7.5	15 2 7.5	15 2 10	20 2 12.5
Clin Slat Slat Bas Floo	nate Zone: o Insulation R- o Insulation De ement Wall Co or Assembly U-	Value: epth (ft): ontinuous Insul -Factor:		·	CZ 1 0 0 0 0 0.066	CZ 2 0 0 0 0 0.033	CZ 3 0 0 0 0 0.033	10 2 7.5 0.033	10 2 7.5 0.033	15 2 7.5 0.033	15 2 10 0.033	20 2 12.5 0.033
Clin Slak Slak Bas Floo Wal	nate Zone: o Insulation R- o Insulation De ement Wall Co	Value: epth (ft): ontinuous Insul -Factor: Factor:		·	CZ 1 0 0 0	CZ 2 0 0 0	CZ 3 0 0 0	10 2 7.5	10 2 7.5	15 2 7.5	15 2 10	20 2 12.5
Clin Slak Slak Bas Floo Wal Ceil	nate Zone: o Insulation R- o Insulation De ement Wall Co or Assembly U-I I Assembly U-I ing Assembly	Value: epth (ft): ontinuous Insul -Factor: Factor:	lation R-Val	ue:	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027	CZ 3 0 0 0 0 0.033 0.064	10 2 7.5 0.033 0.064	10 2 7.5 0.033 0.064	15 2 7.5 0.033 0.051	15 2 10 0.033 0.051	20 2 12.5 0.033 0.036
Clin Slat Slat Bas Floo Wal Ceil	nate Zone: o Insulation R- o Insulation De ement Wall Co or Assembly U- I Assembly U- ing Assembly ofiltration rates r	Value: epth (ft): entinuous Insul -Factor: Factor: U-Factor:	lation R-Val	ue: CFM50/ft	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027	CZ 3 0 0 0 0 0.033 0.064	10 2 7.5 0.033 0.064	10 2 7.5 0.033 0.064	15 2 7.5 0.033 0.051	15 2 10 0.033 0.051	20 2 12.5 0.033 0.036
Clin Slak Slak Bas Floo Wal Ceil	nate Zone: o Insulation R- o Insulation De ement Wall Co or Assembly U- I Assembly U- ing Assembly ofiltration rates r	Value: epth (ft): entinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do	lation R-Val	l ue: CFM50/fi d, as illu	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027	10 2 7.5 0.033 0.064	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bas Floo Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U- I Assembly U- ling Assembly nfiltration rates r NERGY STAR Window U-	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do	lation R-Val	CFM50/fi d, as illu 2	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027 sure elow:	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.021	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021	20 2 12.5 0.033 0.036 0.021
Clin Slat Slat Bas Floo Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U- I Assembly U- ing Assembly filtration rates r NERGY STAR Window U- Factor Value: Window SHGC	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do	lation R-Val ows: <0.30 Coors modele 40 in CZs 1,	CFM50/fi d, as illu 2	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027 sure elow:	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.021	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bass Floo Wal Ceill	nate Zone: b Insulation R-b Insulation Determined Wall Coor Assembly U-I Assembly U-I Ing Assembly Infiltration rates represented Window U-Factor Value:	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do	lation R-Val ows: <0.30 Coors modele 40 in CZs 1,	CFM50/ffd, as illu 2	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40	10 2 7.5 0.033 0.064 0.021 in CZ 4	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bas Floo Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U-I ing Assembly U-I ing Assembly filtration rates r NERGY STAR Window U- Factor Value: Window SHGC	Value: epth (ft): entinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4	ows: <0.30 Coors modele 40 in CZs 1,	CFM50/fi d, as illu 2 2	CZ 1 0 0 0 0.066 0.064 0.027	CZ 2 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40	10 2 7.5 0.033 0.064 0.021 in CZ 4	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5	20 2 12.5 0.033 0.036 0.021
Clin Slak Bassa Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U- I Assembly U- ling Assembly offiltration rates r NERGY STAR Window U- Factor Value: Window SHGC Door U- F-Vactor lue: Door SHGC: ption: Class AW	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 C: 0.2	Dws: <0.30 Coors modeled output for CZs 1, f	CFM50/fi d, as illu 2 2	CZ 1 0 0 0 0.066 0.064 0.027 12 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 ≤½ lite: 0.25	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5,	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bassa Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U- I Assembly U- ling Assembly offiltration rates r NERGY STAR Window U- FactorValue: Window SHGC Door U- F-Vactorlue: Door SHGC: ption: Class AW	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 C: 0.5 V windows mode e:	Dws: <0.30 Coors modele 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17	CFM50/ff d, as illu 2 2 7 / G IgCC le	CZ 1 0 0 0 0.066 0.064 0.027 2 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 mmercial win CZ 3	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctorValue req	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 4	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bassa Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U-I I Assembly U-I ing Assembly offiltration rates r NERGY STAR Window U- FactorValue: Window SHGC Door U- F-Vactorlue: Door SHGC: ption: Class AW Climate Zone Fixed Windo	Value: epth (ft): portinuous Insul -Factor: Factor: modeled as follo windows and do 0.4 0.7 V windows mode e: w U-FVactorale	Dws: <0.30 Coors modele 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17	CFM50/fi d, as illu 2 2	CZ 1 0 0 0 0.066 0.064 0.027 12 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 ≤½ lite: 0.25	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctorValue req	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5,	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bassa Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U-I I Assembly U-I ing Assembly offiltration rates r NERGY STAR Window U- FactorValue: Window SHGC Door U- F-Vactorlue: Door SHGC: ption: Class AW Climate Zone Fixed Windo Operable Windo	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 0.4 V windows mode e: w U-FVactoralu ndow U-	Dws: <0.30 Coors modele 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17	CFM50/ff d, as illu 2 2 7 / G IgCC le	CZ 1 0 0 0 0.066 0.064 0.027 2 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 mmercial win CZ 3	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctorValue req	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 4	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5	20 2 12.5 0.033 0.036 0.021
Clin Slak Slak Bassa Wal Ceil	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U-I I Assembly U-I ing Assembly offiltration rates r NERGY STAR Window U- FactorValue: Window SHGC Door U- F-Vactorlue: Door SHGC: ption: Class AW Climate Zone Fixed Windo	Value: epth (ft): portinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 0.7 V windows mode e: w U-FVactorale ndow U-	Dws: <0.30 Coors modele 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17	CFM50/ffd, as illu 2 2 2 6 IgCC le CZ 1 0.48	CZ 1 0 0 0 0.066 0.064 0.027 c² of enclor ustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 ≤½ lite: 0.25 mmercial win CZ 3 0.44	CZ 3 0 0 0 0.033 0.064 0.027 3 3 5 dow U- <u>Fa</u> CZ 4 0.36	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctor Value req 0	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 5 in CZ 5	15 2 7.5 0.033 0.051 0.021	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5, Zs 4,5,6,7,8	20 2 12.5 0.033 0.036 0.021 ,6,7,8 6,7,8 6,7,8
Clinton Slate Slat	nate Zone: o Insulation R- o Insulation R- o Insulation De- ement Wall Co- or Assembly U-I I Assembly U-I ing Assembly offiltration rates r NERGY STAR Window U- Factor Value: Window SHGC Door U- F-Vactorlue: Door SHGC: ption: Class AW Climate Zone Fixed Windo Operable Win Factor Value:	Value: epth (ft): portinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 0.7 V windows mode e: w U-FVactorale ndow U-	Dws: <0.30 Coors modele 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17	CFM50/fid, as illuzed	CZ 1 0 0 0 0.066 0.064 0.027 12 of encloustrated between Control CZ 2 0.48 0.62	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 mmercial win CZ 3 0.44 0.57	CZ 3 0 0 0 0.033 0.064 0.027	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctor Value req 0	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 5 uirements) C & 5 .36	15 2 7.5 0.033 0.051 0.021 0.40 in C	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5, Zs 4,5,6,7,8 CZ 7 0.28 0.35	20 2 12.5 0.033 0.036 0.021 ,6,7,8 6,7,8 6,7,8 CZ 8 0.28 0.35
Clin Slat Slat Slat Slat Slat Slat Slat Slat	nate Zone: o Insulation R- o Insulation Period Insulation Deferment Wall Coor Assembly U-I Assembly U-I Ing Ing Ing Ing Ing Ing Ing Ing Ing In	Value: epth (ft): portinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 0.7 V windows mode e: w U-FVactorale ndow U-	Dows: <0.30 Coors modeled 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17 Dpaque: Any eled to 2015	FM50/fd, as illu 2 2 2 6 IgCC le CZ 1 0.48 0.62 0.25	CZ 1 0 0 0 0.066 0.064 0.027 2 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 ≤½ lite: 0.25 mmercial win CZ 3 0.44 0.57 0.25	CZ 3 0 0 0 0.033 0.064 0.027 3 3 3 5 6 CZ 4 0.36 0.43 0.40	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctor Value req 0	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 5 uirements) C & 5 .36	15 2 7.5 0.033 0.051 0.021 0.40 in C	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5, Zs 4,5,6,7,8 CZ 7 0.28 0.35	20 2 12.5 0.033 0.036 0.021 ,6,7,8 6,7,8 6,7,8 CZ 8 0.28 0.35
Clin Slat Slat Slat Slat Slat Slat Slat Slat	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U- I Assembly U- ling Assembly offiltration rates r NERGY STAR Window U- Factor-Value: Window SHGC Door U- F-Vactor-lue: Door SHGC: ption: Class AW Climate Zone Fixed Windo Operable Win Factor-Value: SHGC (same er Heater	Value: epth (ft): entinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0 0 V windows mode e: w U-FVactorale ndow U- : eas above)	Dows: <0.30 Coors modeled to CZs 1, CZs in CZs 1, C	CFM50/fid, as illuzed	CZ 1 0 0 0 0.066 0.064 0.027 12 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 ≤½ lite: 0.25 mmercial win CZ 3 0.44 0.57 0.25	CZ 3 0 0 0 0.033 0.064 0.027 3 3 3 dow U-Fat 0.36 0.43 0.40	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctorValue req 0 0	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 5 uirements) C & 5 .36	15 2 7.5 0.033 0.051 0.021 0.40 in C. CZ 6 0.34 0.41 0.40	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5 CZ 7 0.28 0.35 any0.40	20 2 12.5 0.033 0.036 0.021 6,6,7,8 6,7,8 6,7,8 0.28 0.28 0.35 any0.40
Clin Slat Slat Slat Bass Floor Wall Ceill	nate Zone: o Insulation R- o Insulation De- ement Wall Co- or Assembly U- I Assembly U- ling Assembly offiltration rates r NERGY STAR Window U- Factor-Value: Window SHGC Door U- F-Vactor-lue: Door SHGC: ption: Class AW Climate Zone Fixed Windo Operable Win Factor-Value: SHGC (same er Heater	Value: epth (ft): ontinuous Insul -Factor: Factor: U-Factor: modeled as follo windows and do 0.4 0.4 0.7 V windows mode e: w U-FVactoral ndow U- exas above)	Dows: <0.30 Coors modeled 40 in CZs 1, 25 in CZs 1, Dpaque: 0.17 Dpaque: Any eled to 2015 ue: he following	CFM50/fid, as illuzed	CZ 1 0 0 0 0.066 0.064 0.027 2 of encloustrated b	CZ 2 0 0 0 0 0.033 0.064 0.027 sure elow: 0.30 in CZ 3 ≤½ lite: 0.25 ≤½ lite: 0.25 mmercial win CZ 3 0.44 0.57 0.25	CZ 3 0 0 0 0.033 0.064 0.027 3 3 3 dow U-Fat 0.36 0.43 0.40	10 2 7.5 0.033 0.064 0.027 0.30 0.40 >½ lite: 0.30 >½ lite: 0.25 ctorValue req CZ 4 0 0	10 2 7.5 0.033 0.064 0.021 in CZ 4 in CZ 4 in CZ 5 in CZ 4	15 2 7.5 0.033 0.051 0.021 0.40 in C: CZ 6 0.34 0.41 0.40	15 2 10 0.033 0.051 0.021 27 in CZs 5 ny in CZs 5, Zs 4,5,6,7,8 CZ 7 0.28 0.35 any0.40	20 2 12.5 0.033 0.036 0.021 ,6,7,8 6,7,8 6,7,8 0.28 0.35 any0.40

Thermostat & Ductwork

30 Gal = 0.64 EF

40 Gal = 0.62 EF

50 Gal = 0.60 EF

60 Gal = 0.58 EF

80 Gal = 0.54 EF

80 Gal = 1.97 EF

70 Gal = 0.56 EF

- Programmable thermostat modeled.
- All ducts and air handlers modeled within conditioned space.

Lighting, Appliances, & Fixtures

- ENERGY STAR refrigerators, dishwashers, clothes washers, clothes dryers, and ceiling fans modeled.
- ENERGY STAR light bulbs or fixtures modeled in 90% of ANSI / RESNET / ICC Standard 301 RESNET-defined Qualifying Light Fixture Locations.

ENERGY STAR Multifamily Reference Design, Oregon and Washington Version 1.2

2012 IECC Climate Zone 4C, 5, & 6 10

Cooling Equipment (Where Provided)

- Cooling equipment modeled at the applicable efficiency levels below 11:
- 13 SEER AC,
- Heat pump (See Heating Equipment)

Heating Equipment

- Heating equipment modeled at the applicable efficiency levels below, dependent on fuel and system type 11:
- 95 AFUE ENERGY STAR gas furnace,
- 85 AFUE ENERGY STAR oil furnace,
- 90 AFUE ENERGY STAR gas boiler,
- 86 AFUE oil boiler,
- 9.5 HSPF / 15 SEER / 12 EER air-source with/ electric or dual-fuel backup

Envelope, Windows, & Doors

Insulation levels modeled at the levels below and Grade I installation per ANSI / RESNET / ICC Standard 301.

Above-Grade Wall	<u>Ceiling</u>	<u>Floor</u>	Basement Wall	On-Grade & Below-Grade Slab
<u>R-21</u>	<u>R-49</u>	<u>R-38</u>	R-15 continuous or R-21 cavity	R-10 at perimeter for entire depth of slab and under entire slab area

- Infiltration rates modeled as follows: <0.30 CFM50/ft² of enclosure
- Windows and doors modeled, as illustrated below:

Window U-Factor:	<u>0.27</u>
Window SHGC:	0.30

Door U-Factor:	<u>Opaque: 0.17</u>	≤½ lite: 0.25	>½ lite: 0.30
Door SHGC:	Opaque: Any	≤½ lite: 0.25	>½ lite: 0.30

Exception: Class AW windows modeled to 2015 IgCC levels (Commercial window U-Factor requirements)

Climate Zone:	CZ 4 C & 5	<u>CZ 6</u>
Fixed Window U-Factor:	0.36	0.34
Operable Window U-Factor:	0.43	0.41
SHGC (same as above)	<u>0.30</u>	0.30

Water Heater

- DHW equipment modeled with the following efficiency levels and types as applicable:
- For a home with gas or propane DHW fuel type: Tankless 0.91 EF
- For a home with other DHW fuel type: In CZ 4C & 5 ¹⁰: Electric heat pump with 2.5 EF or 2.57 UEF; In CZ 6 ¹⁰: Electric heat pump with 2.0 EF / UEF

 —DHW piping insulation modeled: R-3

Thermostat & Ductwork

- Programmable thermostat modeled.
- All ducts located in unconditioned space modeled with R-8 insulation.
- Duct leakage to outdoors modeled as the greater of 4 CFM25 per 100 sq. ft. or 40 CFM25.

Lighting, Appliances, & Fixtures

- ENERGY STAR refrigerators, dishwashers, clothes washers, clothes dryers, and ceiling fans modeled.
- ENERGY STAR light bulbs or fixtures modeled in 90% of ANSI / RESNET / ICC Standard 301-defined Qualifying Light Fixture Locations. 11, 12
- WaterSense bathroom faucets, bathroom aerators, and showerheads, modeled with 2.0 gallons per minute.- 11

Exhibit 2: Mandatory Requirements for All Certified Multifamily Projects

Party Responsible	Mandatory Requirements				
Rater	Completion of National Rater Design Review Checklist				
	Completion of National Rater Field Checklist				
HVAC System Designer	Completion of National HVAC Design Report				
Functional Testing Agent	Completion of National HVAC Functional Testing Checklist				
Builder or Developer	Completion of National Water Management System Builder Requirements				

Effective Date

Exhibit 3: ENERGY STAR Multifamily New Construction Version 1.1 Implementation Timeline

EPA intends to implement the Version 1.1 program requirements for projects permitted starting one year after state-level implementation of the 2012 IECC or an equivalent code. However, EPA will make a final determination of the implementation timeline on a state-by-state basis. Exhibit 3 defines the Version 1.1 implementation timeline for states where EPA has made this determination. Projects permitted prior to the implementation timeline, and projects in states on the 2009 IECC or equivalent, are eligible to earn the ENERGY STAR under Version 1.0 of the program requirements.

Note that regional program requirements and associated implementation schedules are under review for projects in CA, WA and OR -For the ERI and Prescriptive Paths, to determine the program Version that a multifamily building is required to be certified under, look up the location and permit date of the building in Exhibit 3. Note that the National Version 1.1 program requirements are being implemented in states that have adopted the residential 2012, 2015, or 2018 IECC, or an equivalent code. Note, as well, that regional program requirements, and associated implementation timelines, have been developed for buildings in CA. The regional program requirements can be found at www.energystar.gov/mfncrequirements.

This Exhibit contains all implementation timelines applicable on or after September 1, 2016. Implementation timelines applicable prior to this date can be obtained by contacting mfnc@energystar.gov. Multifamily buildings permitted prior to January 1, 202101-01-2021 are permitted to participate in any of the following programs, as long as the project meets the Eligibility Requirements defined within that program: the ENERGY STAR Certified Homes program, the ENERGY STAR Multifamily High Rise program, or this ENERGY STAR Multifamily New Construction Program.

Exhibit 3: ENERGY STAR Multifamily New Construction Implementation Timeline

State / Territory	Buildings Permitted ⁴ On or After This Date Must Meet the Adjacent Version	Multifamily New Construction Program Version
AL, AK, AZ, AR, CO, GA, GU, HI, IN, ID, KS, KY, LA, ME, MS, MO, NE, NH, NM, NMI, NC, ND, OH, OK, PA, PR, SC, SD, TN, USVI, UT, VA, WV, WI, WY	01-01-2021	National Version 1
CT, DC, DE, FL, IA, IL, MA, MD, MI, MN, MT, NJ, NV, NY, RI, TX, VT	01-01-2021	National Version 1.1
OR, WA	<u>01-01-2021</u>	Oregon and Washington Version 1.2

State	Applicable to Projects with the Following Permit Date
FL,	On or after 07/01/2012
MA	On or after 01/01/2015
DC, IL, MD, RI	On or after 04/01/2015 (except for Calvert County and St. Mary's County in MD, for which the applicable permit date is on or after 07/01/2015)
IA	On or after 06/01/2015
ĐE	On or after 12/01/2015
MT,OR, WA	On or after 01/01/2016
MN, VT	On or after 04/01/2016
NV	On or after 07/01/2016
MI, NJ	On or after 04/01/2017
NY, TX	On or after 10/01/2017

Exhibit 4: ASHRAE / Title 24 Path Performance Targets

Projects using the ASHRAE/Title-24 Path in states that have adopted as the commercial code the 2012 IECC, 2015 IECC, 2018 IECC, ASHRAE 90.1-2010, ASHRAE 90.1-2013, ASHRAE 90.1-20136, or equivalent, or Title-24, will be required to meet a Performance Target of 15% better than the energy code under which the building is permitted (unless otherwise noted below). All other projects must meet the national requirement of 15% over ASHRAE 90.1- 2007.

Notes and Exceptions:

- Local Code Exception: While local city or town codes may differ from the state code, the determination for the ENERGY STAR program is based on the commercial code adopted by the state, not the local jurisdiction. In an instance where the building is permitted under a local code that is not the same as the state code, the Performance Target is based on the state code in place. The permit application or issue date will be used to determine what state code was in place in the state. To determine the code adopted by the state and its effective date, please visit www.energycodes.gov.:
- California: For projects in California that are permitted to Title 24–2016, the Performance Target is 10% TDV energy savings above Title 24–2016.
- Modeling options: To reduce the burden of applying two different codes to a given project, projects are allowed to use alternate targets of 20% savings over ASHRAE 90.1-2007 as equivalent to 15% over ASHRAE 90.1-2010; and 25% savings over ASHRAE 90.1-2007 and 20% savings over ASHRAE 90.1-2010, as equivalent alternatives to 15% savings over ASHRAE 90.1-2013.
- Appendix G version: For projects pursuing performance targets based on ASHRAE 90.1-2007 or ASHRAE 90.1-2010, the project must use the Appendix G of the code corresponding to their Performance Target or Appendix G from ASHRAE 90.1-2016. Projects pursuing targets based on ASHRAE 90.1-2013 or later must use Appendix G from ASHRAE 90.1-2016. Projects using Appendix G from ASHRAE 90.1-2016 must use the Performance Path Calculator_AppG2016 and Simulation Guidelines_AppG2016 available on the Guidance Documents Quidance Documents page which can be found at energystar.gov/mfguidance [Note: Documents and web page will be updated for new program]. Projects may not use Appendix G from ASHRAE 90.1-2016 if they are using the 20% or 25% Performance Target Options. Note: Addendum bm from ASHRAE 90.1-2013 is not referenced since its content and the related excerpts that followed have been incorporated into Appendix G from ASHRAE 90.1-2016.

Performance Target Options: Savings (%) above varying ASHRAE 90.1 Baselines					
State Code	90.1-2007	90.1-2010	90.1-2013		
2009 IECC	15% ^{1<u>3</u>0}	N <u>/</u> A	N <u>/</u> A		
2012 IECC	20% ¹⁴ 4	15% ^{1<u>3</u>0}	N <u>/</u> A		
2015 IECC	25% ¹⁴⁴	20% ^{1<u>4</u>1}	15% ^{1<u>5</u>2}		

Footnotes:

- 1. The term 'building' refers to a structure utilized or intended for supporting or sheltering any 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'which at least 90% of its boundary is comprised of exterior walls. A dwelling unit, as defined by the 2012 IECC, is a single unit that provides complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation. 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.-The term 'two-family' dwelling refers to a detached building with 2 dwelling units.
- 2. The term 'common space' refers to any spaces on the property 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, or parking garages used exclusively by residents, building staff, and their guests. This also includes offices used by building management, administration or maintenance and all special use areas located on the property to serve and support the residents such as day-care facilities, gyms, dining halls, etc.
- 3. Provided the ENERGY STAR Certified Homes Rater Field Checklist is updated to require compartmentalization (as described in the Multifamily Rater Field Checklist Item 4.10) for attached units except two-family dwellings and townhomes, the following units are also eligible to go through the Certified Homes program:
- 4. Buildings with 4 or fewer units
 - Buildings that are 3 stories or less, have no central systems, and have <20% common space.2
- 5-3. Units pursuing this option must still be modeled to Exhibit 1 of the ENERGY STAR Multifamily National Program Requirements, even while going through the Certified Homes programThe term 'townhouse' refers to a single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides. Townhouses earning the ENERGY STAR through the Multifamily New Construction program must use the ERI Path of the Multifamily New Construction program and must be modeled to Exhibit 1 of the relevant ENERGY STAR Certified Homes National Program Requirements. Townhouses are also eligible to earn the ENERGY STAR through the Certified Homes program.
- 4. The Rater may define the 'permit date' as either the date that the permit was issued or the application date of the permit. In cases where permit or application dates are not available, Providers or Multifamily Oversight Organizations have discretion to estimate permit dates based on other construction schedule factors. These assumptions should be both defensible and documented.
- 6-5. Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:
 - a. Where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met;
 - b. Where overlapping requirements conflict with a requirement of the ENERGY STAR program (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these program requirements shall not be met. Certification shall only be allowed if the Rater has determined that no equivalent option is available that could meet the intent of the conflicting requirement (e.g., switching from exterior to interior slab edge insulation). Note that a project must still meet its Performance Target. Therefore, other efficiency measures may be needed to compensate for the omission of the conflicting requirement.
- 7.6. The term 'Rater' refers to the person completing the third-party inspections required for certification. This person shall: a) be a Ceertified Home Energy—Rater, Rating FieldApproved 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/mfnewhomestraining. [Note: This will be updated for the new program]
 - Raters who operate under an MRO or a Sampling Provider are permitted to verify the Minimum_minimum_Rated_rated_Features features of the home-building and to verify any Checklist Item designated "Rater Verified" using the a VOORESNET-approved sampling protocol for homes outside California, and the CEC-approved sampling protocol for homes in CA. Where a sampling protocol does not sufficiently describe methodology for multifamily projects, use the RESNET Guidelines for Multifamily Energy RatingsRESNET Guidelines for Multifamily Energy Ratings, available at resnet.us/blog/resnet-adopts-guidelines-for-multifamily-energy-ratings/.—No parties other than Raters are permitted to use sampling. All other items shall be verified for each certified homebuilding. For example, no items on the National HVAC Functional Testing Checklist are permitted to be verified using a sampling protocol.
- 8-7. These requirements apply to all dwelling units, sleeping units, most common spaces ³² on the property, and parking lots. These requirements do not apply to common spaces that are located in buildings on the property without any dwelling or sleeping units.
- 9.8. The software program shall automatically determine (i.e., without relying on a user-configured ENERGY STAR Multifamily Reference Design) this target for each rated <a href="https://heme-unit.by/h
- 40. These National Program Requirements are required to certify all projects permitted after TBD, but are allowed to be used for any project permitted or completed prior to this date. The Rater may define the 'permit date' as either the date that the permit was issued or the application date of the permit. In cases where permit or application dates are not available, Providers or Multifamily

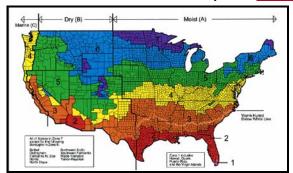


Draft National Program Requirements

ENERGY STAR Multifamily New Construction, Version 1.0 / -1.1 / OR-WA 1.2

Oversight Organizations have discretion to estimate permit dates based on other construction schedule factors. These assumptions should be both defensible and documented.

- 9. Note that the efficiency levels of ENERGY STAR certified products aligned with these product specifications when this Version was first released. These efficiency features form the basis of the ENERGY STAR ERI target, regardless of any subsequent revisions to ENERGY STAR certified product specifications. EPA recommends, but does not require, that current ENERGY STAR products be included in ENERGY STAR buildings. For current ENERGY STAR products, visit www.energystar.gov/products.
- 44.10. The following map illustrates the Climate Zone boundaries as defined by the 2009 and 201242 IECC Figure R301.1.



- 11. When using the Reference Design for common space measures as specified in the National Rater Design and Rater Field Checklist, first review the Common Space Applicability Notes that are included in Exhibit 1.
- 12. The version of ANSI / RESNET / ICC Std. 301 utilized by RESNET for HERS ratings is used to model this parameter.
- 42.13. Appendix G from the referenced code or from ASHRAE 90.1-2016 or may be used.
- 43.14. These Performance Target options may not be used for projects using Appendix G from ASHRAE 90.1-2016.
- 14. Appendix G from ASHRAE 90.1-2016 must be used.

15.