

National ERI Target Procedure (ANSI 301-2014) ENERGY STAR Multifamily New Construction, Version 1.1 (Rev. 01).

National ERI Target Procedure for use with ANSI/RESNET/ICC 301-2014

This document provides detailed instructions for determining the ENERGY STAR ERI Target, the highest ERI value that each rated multifamily unit, excluding townhouses, may achieve to earn the ENERGY STAR. Note that, in addition to meeting the ENERGY STAR ERI Target for each unit, units shall also meet all Mandatory Requirements for All Multifamily New Construction Projects in Exhibit 2 of the National Program Requirements for ENERGY STAR Multifamily New Construction, Version 1 / 1.1 / OR-WA 1.2. While Townhouses are eligible to earn ENERGY STAR Multifamily New Construction by meeting their ENERGY STAR ERI Target and also meeting all Mandatory Requirements for All Multifamily New Construction Projects in Exhibit 2 of the National Program Requirements, the instructions for determining their ENERGY STAR ERI Target is in the National ERI Target Procedure for ENERGY STAR Certified Homes.

An EPA-recognized Verification Oversight Organization's Approved software Reating Teool-approved by an EPA-Approved Verification Oversight Organization —shall automatically determine (i.e., without relying on a user-configured ENERGY STAR Multifamily Reference Design) this target for each rated unit. This shall be done by configuring the ENERGY STAR Multifamily Reference Design in accordance with Exhibit 1, the Expanded ENERGY STAR Multifamily Reference Design Definition, and calculating its associated ERI value. The ERI value shall be calculated using ANSI / RESNET / ICC Standard 301-2014 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 301-2014 shall also be followed. Any exceptions shall be approved by EPA and reported at www.energystar.gov/ERIExceptions. This value, rounded to the nearest whole number, shall equal the ENERGY STAR ERI Target.

The National ERI Target Procedure (ANSI 301-2019) must instead be used to determine the ENERGY STAR ERI Target when using ANSI / RESNET / ICC Standard 301-2019.

Revised 10/185/20198



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ENERGY STAR Multifamily New Construction, Version 1.1 (Rev. 01).

Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition

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Building Component												
Foundations:	Construction Type & Structural Mass: Same as Rated Unit ² , except: • For masonry floor slabs, modeled with 80% of floor area covered by carpet and 20% of floor directly exposed to room air Conditioning Type: Same as Rated Unit ² , except:											
	Crawlspaces shall be modeled as vented with net free vent aperture = 1sq. ft. per 150 sq. ft. of crawlspace floor area Once A see Base as Base this; 2											
	Gross Area: Same as Rated Unit ² Insulation: ^{3, 4} Choose appropriate insulation	n lovel below:										
	Basement Wall Continuous Insulation		naliae ta a	anditionad	bacomonte:	if applicable inculati	on chall ha	located on i	ntorior			
	side of walls	i K-value offiy a	pplies to c	onunioneu	basements,	ii applicable, irisulati	on snan be	located off i	HEHOI			
	Floor assemblies above crawlspace	oundations shall	be confid	ured to me	et the applica	able floor assembly l	J-factor list	ed in the bui	ildina			
	component section for Floors Over U	nconditioned Sp	aces		or are applied				9			
	 Slab floors with a floor surface less than 24" below grade shall be insulated to the Slab Insulation R-value. The insulation shall extend 											
	downward from the top of the slab or											
	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	0	0	0	7.5	7.5	7.5	10	12.5			
	Continuous Insulation R-Value:											
Floors Over	Construction Type: Wood frame											
Unconditioned	Gross Area: Same as Rated Unit ²											
Spaces:	Insulation: 3,4				<u>-</u>							
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Floor Assembly U-Factor:	0.066	0.033	0.033	0.033	0.033	0.033	0.033	0.033			
Above-Grade	Interior and Exterior Construction Type: W	ood frame										
Walls:	Gross Area: Same as Rated Unit ²											
	Solar Absorptance = 0.75											
	Emittance = 0.90											
	Insulation: 3											
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Wall Assembly U-Factor:	0.064	0.064	0.064	0.064	0.064	0.051	0.051	0.036			
Thermally Isolated Sunrooms:	None											
Doors:	Area: Same as Rated Unit ²											
	Orientation: Same as Rated Unit ²	(0715 5										
	U-Factors and SHGCs, based on ENERG											
	Door Type: U-Factor:	Opaque	•		/2-Lite	> 1/2-Lite CZ	1-3	> 1/2-Lite (
	SHGC:	0.17 n/a).25).25	0.30 0.25		0.30 0.40				
Glazing:	Total Area: AG = 0.15 x CFA x FA x F, with		vailable v		0.20	0.23		0.40				
Glazing.	Orientation: Same as Rated Unit ² , by perd		ivaliable w	all alta =								
					I h. ANOL / D	FONET / ICC Ctd 2	04.7					
	Interior Shade Coefficient: Same as Energ	y Rating Referer	ice Home	as defined	DY ANSI / R	ESNET / ICC 5td. 3	01.					
	External Shading: None											
		ENED OV OTA	D.W. I	5								
	Assembly U-Factors and SHGCs, based of				C7.4		C7.0	C7 7				
	Assembly U-Factors and SHGCs , based c Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor:	CZ 1 0.40	CZ 2 0.40	CZ 3 0.30	0.30	0.27	0.27	0.27	0.27			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC:	CZ 1 0.40 0.25	CZ 2 0.40 0.25	CZ 3 0.30 0.25								
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct	CZ 1 0.40 0.25 ural) Windows b	CZ 2 0.40 0.25 ased on 2	CZ 3 0.30 0.25 015 lgCC	0.30 0.40	0.27 0.40	0.27 0.40	0.27 0.40	0.27 0.40			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone:	CZ 1 0.40 0.25 ural) Windows b CZ 1	CZ 2 0.40 0.25 ased on 2 CZ 2	CZ 3 0.30 0.25 015 IgCC CZ 3	0.30 0.40	0.27 0.40 CZ 4 C & 5	0.27 0.40	0.27 0.40	0.27 0.40			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor:	CZ 1 0.40 0.25 ural) Windows b CZ 1 0.48	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48	CZ 3 0.30 0.25 015 IgCC CZ 3 0.44	0.30 0.40 CZ 4 0.36	0.27 0.40 CZ 4 C & 5 0.36	0.27 0.40 CZ 6 0.34	0.27 0.40 CZ 7 0.28	0.27 0.40 CZ 8 0.28			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor:	CZ 1 0.40 0.25 ural) Windows b CZ 1 0.48 0.62	0.40 0.25 ased on 2 CZ 2 0.48 0.62	CZ 3 0.30 0.25 015 IgCC CZ 3 0.44 0.57	0.30 0.40 CZ 4 0.36 0.43	0.27 0.40 CZ 4 C & 5 0.36 0.43	0.27 0.40 CZ 6 0.34 0.41	0.27 0.40 CZ 7 0.28 0.35	0.27 0.40 CZ 8 0.28 0.35			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC:	CZ 1 0.40 0.25 ural) Windows b CZ 1 0.48	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48	CZ 3 0.30 0.25 015 IgCC CZ 3 0.44	0.30 0.40 CZ 4 0.36	0.27 0.40 CZ 4 C & 5 0.36	0.27 0.40 CZ 6 0.34	0.27 0.40 CZ 7 0.28	0.27 0.40 CZ 8 0.28			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None	CZ 1 0.40 0.25 ural) Windows b CZ 1 0.48 0.62	0.40 0.25 ased on 2 CZ 2 0.48 0.62	CZ 3 0.30 0.25 015 IgCC CZ 3 0.44 0.57	0.30 0.40 CZ 4 0.36 0.43	0.27 0.40 CZ 4 C & 5 0.36 0.43	0.27 0.40 CZ 6 0.34 0.41	0.27 0.40 CZ 7 0.28 0.35	0.27 0.40 CZ 8 0.28 0.35			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame	CZ 1 0.40 0.25 ural) Windows b CZ 1 0.48 0.62	0.40 0.25 ased on 2 CZ 2 0.48 0.62	CZ 3 0.30 0.25 015 IgCC CZ 3 0.44 0.57	0.30 0.40 CZ 4 0.36 0.43	0.27 0.40 CZ 4 C & 5 0.36 0.43	0.27 0.40 CZ 6 0.34 0.41	0.27 0.40 CZ 7 0.28 0.35	0.27 0.40 CZ 8 0.28 0.35			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit 2	CZ 1 0.40 0.25 ural) Windows b CZ 1 0.48 0.62	0.40 0.25 ased on 2 CZ 2 0.48 0.62	CZ 3 0.30 0.25 015 IgCC CZ 3 0.44 0.57	0.30 0.40 CZ 4 0.36 0.43	0.27 0.40 CZ 4 C & 5 0.36 0.43	0.27 0.40 CZ 6 0.34 0.41	0.27 0.40 CZ 7 0.28 0.35	0.27 0.40 CZ 8 0.28 0.35			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³	CZ 1 0.40 0.25 (ural) Windows b CZ 1 0.48 0.62 0.25	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone:	CZ 1 0.40 0.25 cural) Windows b CZ 1 0.48 0.62 0.25	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
Ceilings:	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor:	CZ 1 0.40 0.25 cural) Windows b CZ 1 0.48 0.62 0.25	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25 CZ 2 0.027	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25 CZ 3 0.027	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
Ceilings: Top Floor Unit	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit 2 Insulation: 3 Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture =	CZ 1 0.40 0.25 cural) Windows b CZ 1 0.48 0.62 0.25	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25 CZ 2 0.027	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25 CZ 3 0.027	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
Skylights: Ceilings: Top Floor Unit Attics:	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ³ Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture = Radiant Barrier: None	CZ 1 0.40 0.25 (ural) Windows b CZ 1 0.48 0.62 0.25 CZ 1 0.027 1sq. ft. per 300	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25 CZ 2 0.027 sq. ft. ceili	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25 CZ 3 0.027	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
Ceilings: Top Floor Unit	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit 2 Insulation: 3 Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture = Radiant Barrier: None Construction Type: Composition shingle of	CZ 1 0.40 0.25 (ural) Windows b CZ 1 0.48 0.62 0.25 CZ 1 0.027 1sq. ft. per 300	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25 CZ 2 0.027 sq. ft. ceili	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25 CZ 3 0.027	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
Ceilings: Top Floor Unit Attics:	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit 2 Insulation: 3 Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture = Radiant Barrier: None Construction Type: Composition shingle of Gross Area: Same as Rated Unit 2	CZ 1 0.40 0.25 (ural) Windows b CZ 1 0.48 0.62 0.25 CZ 1 0.027 1sq. ft. per 300	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25 CZ 2 0.027 sq. ft. ceili	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25 CZ 3 0.027	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			
Ceilings: Top Floor Unit Attics:	Assembly U-Factors and SHGCs, based of Climate Zone: U-Factor: SHGC: Class AW Assembly U-Factors (i.e., Struct Climate Zone: Fixed Window U-Factor: Operable Window U-Factor: SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit 2 Insulation: 3 Climate Zone: Ceiling Assembly U-Factor: Construction Type: Vented with aperture = Radiant Barrier: None Construction Type: Composition shingle of	CZ 1 0.40 0.25 (ural) Windows b CZ 1 0.48 0.62 0.25 CZ 1 0.027 1sq. ft. per 300	CZ 2 0.40 0.25 ased on 2 CZ 2 0.48 0.62 0.25 CZ 2 0.027 sq. ft. ceili	CZ 3 0.30 0.25 015 lgCC CZ 3 0.44 0.57 0.25 CZ 3 0.027	0.30 0.40 CZ 4 0.36 0.43 0.40	0.27 0.40 CZ 4 C & 5 0.36 0.43 0.40	0.27 0.40 CZ 6 0.34 0.41 0.40	0.27 0.40 CZ 7 0.28 0.35 0.40	0.27 0.40 CZ 8 0.28 0.35 0.40			



ENERGY STAR Multifamily New Construction, Version 1.1 (Rev. 01).

Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition (Continued)

Heating Systems:	Heating capacity shall be selected in ac Reference Design in accordance with A									
	procedure									
	Fuel Type: Same as Rated Unit 2, 86	D - (- D ' I-	- II Is C	and a discount of the second			D . I	L L L - 20 2 -	
	System Type: Same as Rated Unit 2, ex									
	modeled with <u>air-source or ground-sour</u>	ce neat pump,	electric strip	neat or elec	tric baseboai	ra neat, and Ref	erence Design	snall be c	configured	
	with ground-source heat pump in CZ 7 8				ıır-source or g	rouna-source n	eat pump, elec	tric strip <u>n</u>	eat or	
	electric baseboard heat; applicable effic	·				07.40.0.5		~~~~		
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4C & 5	CZ 6	CZ 7	CZ 8	
	Gas Furn. AFUE:	80	80	80	9 <u>5</u> 0	9 <u>5</u> 0	95 95	95 05	95	
	Oil Furn. AFUE:	80	80	80	85	85	85	85	85	
	Gas Boiler AFUE:	80	80	80	90	90	90	90	90	
	Oil Boiler AFUE:	80	80	80	86	86	86	86	86	
	Air-Source Heat Pump HSPF:	8.2	8.2	8.2	8.5	9.25	9.5	n/a	n/a	
	Air-Source Heat Pump Backup:	Electric	Electric	Electric	Electric	Electric	Electric	n/a	n/a	
	Ground-Source Heat Pump COP:	n/a	n/a	n/a	n/a	n/a	n/a	3.6	3.6	
	For non-electric warm furnaces and non							ith the me	tnodology	
o "	for the Energy Rating Reference Home									
Cooling	Cooling capacity shall be selected in ac									
Systems:	Reference Design in accordance with A	CCA Manual	i, Eignth Eai	lion, ASHKA	E Handbook	of Fundamental	s, or an equiva	lient comp	utation	
	procedure									
	Fuel Type: Same as Rated Unit 2,86				1 24 1		. 0740	·		
	System Type: Same as Rated Unit 2, ex									
	modeled with <u>air-source or ground-sour</u>									
	with ground-source heat pump in CZ 7 8				iir-source or g	rouna-source n	eat pump <u>, elec</u>	tric strip n	eat, or	
	electric baseboard heat; applicable effic									
	Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8	
	AC SEER:	15	15	15	1 <u>53</u>	14 <u>3</u>	13	13	13	
	Air-Source Heat Pump SEER:	15	15	15	15	15	15	n/a	n/a	
	Ground-Source Heat Pump EER:	n/a	n/a	n/a	n/a	n/a	n/a	17.1	17.1	
Service	Use (Gallons per Day): Same as Energy						301, except for	r reduced	usage	
Water	resulting from the equipment specified in									
							_			
	Tank Temperature: Same as Energy Ra						7			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year						7			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 95}	iting Referenc	e Home, as	defined by A	NSI / RESNE	T / ICC Std. 301				
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 80} System Type: Conventional storage wat	ting Reference	e Home, as tank size ed	defined by A	NSI / RESNE	T / ICC Std. 30°	nit uses instant			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 80} System Type: Conventional storage wat in which case select 50 gallon tank for g	ting Reference	e Home, as tank size ed	defined by A	NSI / RESNE	T / ICC Std. 30°	nit uses instant			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 8g} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign	ting Reference	e Home, as tank size ed	defined by A qual to that of tank for elec	NSI / RESNE	T / ICC Std. 30°	nit uses instant e efficiency fro			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 8g} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity:	ting Reference	e Home, as tank size ed	defined by A qual to that of tank for elec ≤ 55 Gal	NSI / RESNE	T / ICC Std. 30°	nit uses instant e efficiency fro > 55 Gal			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF:	ting Reference	e Home, as tank size ed	defined by A qual to that of tank for elec	NSI / RESNE	T / ICC Std. 30°	nit uses instant e efficiency fro > 55 Gal 0.77 EF			
Heating Systems:	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 8g} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity:	ting Reference	e Home, as tank size ed	defined by A qual to that of tank for elec ≤ 55 Gal	NSI / RESNE	T / ICC Std. 30°	nit uses instant e efficiency fro > 55 Gal			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF:	ting Reference	e Home, as tank size ed	ual to that of tank for election ≤ 55 Gal 0.67 EF	NSI / RESNE	T / ICC Std. 30°	nit uses instant e efficiency fro > 55 Gal 0.77 EF			
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF:	er heater with	e Home, as tank size ed	ual to that of tank for elections 55 Gal 0.67 EF ≤ 55 Gal	NSI / RESNE	T / ICC Std. 30°	nit uses instant e efficiency fro > 55 Gal 0.77 EF > 55 Gal	om below u		
	Tank Temperature: Same as Energy Ra Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit ^{2, 86} System Type: Conventional storage wat in which case select 50 gallon tank for g size of Reference UnitDesign Gas Storage Tank Capacity: Gas DHW EF:	er heater with	tank size ec	ual to that of tank for elections ≤ 55 Gal 0.67 EF ≤ 55 Gal 0.95 EF	RSI / RESNE f Rated Unit, tric systems.	T / ICC Std. 30 ² unless Rated Ur Select applicabl	nit uses instant e efficiency fro > 55 Gal 0.77 EF > 55 Gal 2.00 EF	om below u	ising tank	
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Fan Watts: Watts = CFM Rate / 2.8 CFM per Watt, where CFM Rate is determined above								
Climate Zone:	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8
Ventilation Type:	Supply	Supply	Supply	Supply	Exhaust	Exhaust	Exhaust	Exhaust

Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition (Continued)

	Exilibit 1. Expand	10G E.TE.TO.	O 17 til tillaltilali	ing recipional	, Booign Bonni		· 				
Lighting,	Lighting: Fraction of qualifying Tier I fixtures to all fixtures in qualifying light fixture locations 90% for interior; 0% for exterior and garage										
Appliances, Fixtures & Internal Gains:	Refrigerator: 423 kWh per year										
	Dishwasher: 0.66 EF, Place Setting Capacity Same as Rated Unit 2; use 12 settings if no dishwasher installed in Rated Unit										
	Clothes Washer: Use t	he ENERGY STAR	values below, even if	no clothes washer	is installed. Exception	n: If installed clothes	washer is not				
	available as ENERGY	STAR certified (e.g.	., top-loading commer	cial clothes washer	s, Combination All-In	One Washer-Dryers), model the same				
	as the Rated Unit cloth	as the Rated Unit clothes washer									
		LER	\$/kWh	AGC	\$/therm	CAPw	IMEF				
	ENERGY STAR	152	0.12	12	1.09	4.2	2.06				
	Clothes Dryer: Field Use Factor is 1.04 and CEF is 3.93 for electric and 3.43 for gas, even if no clothes dryer is installed. Exception: If installed clothes dryer is not available as ENERGY STAR certified (e.g., commercial clothes dryers, Combination All-In One Washer-Dryers), model the same as the Rated Unit clothes dryer										
	Ceiling Fan: 122 CFM per Watt; Quantity = Number of bedrooms + 1 when ceiling fans present in the Rated Unit; otherwise Quantity = 0										
	Water fixtures: all showers and faucets ≤ 2.0 gpm										
	Internal Gains: Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC Std. 301, except for adjustments for the lighting, refrigerator, dishwasher, clothes washer, clothes dryer, and ceiling fans specified in this section ⁷										
Internal	Same as Energy Ratin	Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC Std. 301 ⁷									
Mass:	Additional mass specifi	ically designed as a	Thermal Storage Ele	ment for the Rated	Unit shall be excluded	<u></u>					



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Footnotes:

- 1. Any parameter not specified in this exhibit shall be identical to the value entered for the Rated Unit. Where envelope building components do not exist in the Rated Unit, such as a foundation or slab, they should not be modeled in the ENERGY STAR Multifamily Reference Design. Where the envelope component is adiabatic in the Rated Unit, it shall also be adiabatic in the Multifamily Reference Design.
- 2. "Same as Rated Unit" indicates that the parameter shall be identical to the value entered for the Rated Unit.
- 3. Slab insulation R-values represent nominal insulation levels; and assembly U-factors for foundations, floors, walls, and ceilings represent the overall assembly, inclusive of sheathing materials, cavity insulation, installation quality, framing, and interior finishes.
- 4. If software allows the user to specify the thermal boundary location independent of the conditioned space boundary in the basement of the Rated Unit, then the thermal boundary of the ENERGY STAR Multifamily Reference Design shall be aligned with this boundary. For example, if the thermal boundary is located at the walls, then the wall insulation shall be configured as if it was a conditioned basement. If the thermal boundary is located at the floor above the basement, then the floor insulation shall be configured as if it was a floor over an unconditioned space.
- 5. All Reference Design window and door U-factor and SHGC requirements for non-structural windows are based on the ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights Version 6.0 as outlined at , except that SHGC values have been assumed for CZ 4C & 5-8. Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion.
- 6.5. When determining the ENERGY STAR ERI Target, the following formula shall be used to determine total window area of the ENERGY STAR Multifamily Reference Design:

 $AG = 0.15 \times CFA \times FA \times F$

Where:

- AG = Total glazing area
- CFA = Total conditioned floor area
- FA = (Gross above-grade thermal boundary wall area) / (Gross above-grade boundary wall area + 0.5 x Gross below-grade thermal boundary wall area)
- F = 1- 0.44 x (Gross common wall area) / (Gross above-grade thermal boundary wall area + Gross common wall area)

And where:

- Thermal boundary wall is any wall that separates conditioned space from unconditioned space, outdoor environment, or the surrounding soil;
- Above-grade thermal boundary wall is any portion of a thermal boundary wall not in contact with soil;
- Below-grade boundary wall is any portion of a thermal boundary wall in soil contact; AND
- Common wall is the total wall area of walls adjacent to other conditioned space, not including foundation walls.

7. The version of ANSI / RESNET / ICC Std. 301 utilized by RESNET for HERS ratings shall be used to configure this parameter.

- 8-6. Fuel type(s) shall be same as Rated Unit, including any dual-fuel equipment where applicable. For a Rated Unit with multiple heating, cooling, or water heating systems using different fuel types, the applicable system capacities and fuel types shall be weighted in accordance with the loads distribution (as calculated by accepted engineering practice for that equipment and fuel type) of the multiple systems.
- 9.7. For a Rated Unit without a heating system, the ENERGY STAR Multifamily Reference Design shall be configured with a 78% AFUE gas furnace system, unless the Rated Unit has no access to natural gas or fossil fuel delivery. In such cases, the ENERGY STAR Reference Multifamily Design shall be configured with a 7.7 HSPF air-source heat pump.
- 40.8. For a Rated Unit without a cooling system, the ENERGY STAR Multifamily Reference Design shall be configured with a 13 SEER electric air conditioner.
- 41.9. That is to say, representative of standard-flow plumbing fixtures, reference clothes washer gallons per day, standard distribution system water use effectiveness, a hot water piping ratio of 1.0, no pipe insulation, and no drain water heater recovery.
- 12.10. To determine domestic hot water (DHW) EF requirements for additional tank sizes, use the following equation: Oil DHW EF ≥ 0.70 (0.002 x Tank Gallon Capacity).
- 13.11. For a Rated Unit with conditioned space below, that does not indirectly use corridor air as the ventilation supply air, the ENERGY STAR Multifamily Reference Design shall instead be configured with an infiltration rate of 0.255 cfm50/ft²:-In accordance with the RESNET Guidelines for Multifamily Energy Ratings, for a Rated Unit with conditioned space below, and software shall either automatically apply a 15% reduction to the compartmentalization results of the Rated Unit or instruct the Rater to apply the reduction. If automatically applied, the software shall make that known, such that the Rater does not also apply the same reduction, which is based on the RESNET Guidelines for Multifamily Energy Ratings. The 15% reduction shall not be applied if the Rated Unit is located in a building where outdoor air for the Rated Unit is supplied to the corridor and is not directly ducted either into the Rated Unit or into the Rated Unit's HVAC system.