

ENERGY STAR Multifamily New Construction, Version 1 (Rev. 032)

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 certification 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 applicable ERI Target Procedure for ENERGY STAR Single-Family New Homes, which varies by location.

An EPA-recognized Home Certification Organization's Approved Software Rating Tool 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 implementation schedule defined by the HCO that the building is being certified under. 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 0912/2201/20220



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Revised <u>09</u>12/2201/20220



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Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition

Building Component	Exhibit 1: Expanded ENE	H ENERGY (STAP Mul		oference De	sign Definition ¹					
Foundations:	Expanded ENERGY STAR Multifamily Reference Design Definition ¹ Construction Type & Structural Mass: Same as Rated Unit ² , except:										
r duridations.	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										
	Crawispaces snail be modeled as vented with net free vent aperture = 1sq. π. per 1su sq. π. of crawispace floor area Gross Area: Same as Rated Unit ²										
	Insulation: 3,4 Choose appropriate insulation level below;										
	Basement Wall Continuous Insulation R-		pplies to c	onditioned	basements;	if applicable, insulat	ion shall be l	ocated on i	nterior		
	side of walls										
	Floor assemblies above crawlspace foundations shall be configured to meet the applicable floor assembly U-factor listed in the building										
	component section for Floors Over Unconditioned Spaces • 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 on the										
	Climate Zone: 5	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 Insulation R-Value:	0	0	0	7.5	7.5	7.5	10	12.5		
Floors Over	Construction Type: Wood frame										
Unconditioned	Gross Area: Same as Rated Unit ²										
Spaces:	Insulation: 3, 4										
•	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8		
	Wood Framed Floor Assembly U-	0.282	0.052	0.033	0.033	0.033	0.033	0.033	0.033		
	Factor:										
Above-Grade	Mass Floor U-Factor: Interior and Exterior Construction Type: Wood	0.322	<u>0.087</u>	<u>0.087</u>	<u>0.074</u>	<u>0.064</u>	<u>0.057</u>	<u>0.051</u>	<u>0.051</u>		
Walls,	Gross Area: Same as Rated Unit ²	паше									
adjacent to	Solar Absorptance = 0.75										
Exterior or	Emittance = 0.90										
Garage:	Insulation: 1, 3										
	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8		
	Wall Assembly U-Factor:	0.089	0.089	0.089	0.089	0.064	0.051	0.051	0.036		
Thermally											
Isolated	None										
Sunrooms:	Annual Common on Data dilloit 2										
Doors: 65	Area: Same as Rated Unit ² Orientation: Same as Rated Unit ²										
	Door Type:	On:	aque		< 1	/2-Lite	> 1/2-Lite				
	U-Factor:		.21			0.27		0.32			
	SHGC:	n	n/a			0.30		0.30			
Glazing: 65	Total Area: AG = 0.15 x CFA x FA x F, without	evceeding :	available w	⁄all area ⁷⁶							
Glazing: 🛰			Orientation: Same as Rated Unit ² , by percentage of area								
_	Orientation: Same as Rated Unit 2, by percenta	age of area									
-	Orientation: Same as Rated Unit ² , by percental Interior Shade Coefficient: Same as Energy Ra	age of area	nce Home,	as defined	d by ANSI / F	RESNET / ICC Std. 3	301				
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None	age of area ating Referer			•						
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵	age of area ating Referer	CZ 2	CZ 3	CZ 4	CZ 4 C & 5	CZ 6	CZ 7	CZ 8		
-	Orientation: Same as Rated Unit ² , by percental Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: 5 U-Value:	age of area ating Referer CZ 1 0.60	CZ 2 0.60	CZ 3 0.35	CZ 4 0.32	CZ 4 C & 5 0.30	CZ 6 0.30	0.30	0.30		
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC:	age of area ating Referer CZ 1 0.60 0.27	CZ 2 0.60 0.27	CZ 3 0.35 0.30	CZ 4	CZ 4 C & 5	CZ 6				
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural	age of area ating Referer CZ 1 0.60 0.27) Windows b	CZ 2 0.60 0.27 pased on 2	CZ 3 0.35 0.30 012 IECC	CZ 4 0.32 0.40	CZ 4 C & 5 0.30 0.40	CZ 6 0.30 0.40	0.30 0.40	0.30 0.40		
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵	age of area ating Referer CZ 1 0.60 0.27) Windows b CZ 1	CZ 2 0.60 0.27 ased on 2 CZ 2	CZ 3 0.35 0.30 012 IECC CZ 3	CZ 4 0.32 0.40	CZ 4 C & 5 0.30 0.40	CZ 6 0.30 0.40	0.30 0.40	0.30 0.40		
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor	cz 1 0.60 0.27) Windows b CZ 1 0.50	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50	CZ 3 0.35 0.30 012 IECC	CZ 4 0.32 0.40 CZ 4 0.38	CZ 4 C & 5 0.30 0.40	CZ 6 0.30 0.40	0.30 0.40 CZ 7 0.29	0.30 0.40 CZ 8 0.29		
-	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵	age of area ating Referer CZ 1 0.60 0.27) Windows b CZ 1	CZ 2 0.60 0.27 ased on 2 CZ 2	CZ 3 0.35 0.30 012 IECC CZ 3 0.46	CZ 4 0.32 0.40	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38	CZ 6 0.30 0.40 CZ 6 0.36	0.30 0.40	0.30 0.40		
Skylights:	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor	cz 1 0.60 0.27) Windows b CZ 1 0.50 0.65	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60	CZ 4 0.32 0.40 CZ 4 0.38 0.45	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45	CZ 6 0.30 0.40 CZ 6 0.36 0.43	0.30 0.40 CZ 7 0.29 0.37	0.30 0.40 CZ 8 0.29 0.37		
Skylights: Ceilings,	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame	cz 1 0.60 0.27) Windows b CZ 1 0.50 0.65	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60	CZ 4 0.32 0.40 CZ 4 0.38 0.45	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45	CZ 6 0.30 0.40 CZ 6 0.36 0.43	0.30 0.40 CZ 7 0.29 0.37	0.30 0.40 CZ 8 0.29 0.37		
Skylights: Ceilings, adjacent to	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ²	cz 1 0.60 0.27) Windows b CZ 1 0.50 0.65	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60	CZ 4 0.32 0.40 CZ 4 0.38 0.45	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45	CZ 6 0.30 0.40 CZ 6 0.36 0.43	0.30 0.40 CZ 7 0.29 0.37	0.30 0.40 CZ 8 0.29 0.37		
Skylights: Ceilings, adjacent to Exterior or	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ^{1,3}	age of area ating Referen CZ 1 0.60 0.27) Windows b CZ 1 0.50 0.65 0.27	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.40	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		
Skylights: Ceilings, adjacent to Exterior or Unconditioned	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ^{1, 3} Climate Zone: ⁵	cz 1 0.60 0.27) Windows b CZ 1 0.50 0.65	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60	CZ 4 0.32 0.40 CZ 4 0.38 0.45	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45	CZ 6 0.30 0.40 CZ 6 0.36 0.43	0.30 0.40 CZ 7 0.29 0.37	0.30 0.40 CZ 8 0.29 0.37		
Skylights: Ceilings, adjacent to Exterior or Unconditioned Space	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ^{1,3}	age of area ating Referen CZ 1 0.60 0.27) Windows b CZ 1 0.50 0.65 0.27	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.40	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		
Skylights: Ceilings, adjacent to Exterior or Unconditioned	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ra External Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ^{1, 3} Climate Zone: ⁵	age of area ating Referer CZ 1 0.60 0.27) Windows b CZ 1 0.50 0.65 0.27	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.40	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		
Skylights: Ceilings, adjacent to Exterior or Unconditioned Space Volumes:	Orientation: Same as Rated Unit ² , by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: ⁵ U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: ⁵ Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: ^{1, 3} Climate Zone: ⁵ Ceiling Assembly U-Factor:	cz 1 0.60 0.27) Windows b cz 1 0.50 0.65 0.27 cz 1 0.027	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceilli	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area 1.8	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.45 0.40 CZ 4 C & 5 0.027	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		
Skylights: Ceilings, adjacent to Exterior or Unconditioned Space Volumes:	Orientation: Same as Rated Unit ², by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: 5 U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: 5 Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: 1, 3 Climate Zone: 5 Ceiling Assembly U-Factor: Construction Type: Vented with aperture = 1sc Radiant Barrier: In climate zones 1-3_5, if >10 I Construction Type: Composition shingle on wood	CZ 1 0.60 0.27) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceilii	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area 1.8	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.45 0.40 CZ 4 C & 5 0.027	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		
Skylights: Ceilings, adjacent to Exterior or Unconditioned Space Volumes: Attics:	Orientation: Same as Rated Unit ², by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: 5 U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: 5 Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: 1, 3 Climate Zone: 5 Ceiling Assembly U-Factor: Construction Type: Vented with aperture = 1sc Radiant Barrier: In climate zones 1-3_5, if >10 I Construction Type: Composition shingle on wood Gross Area: Same as Rated Unit ²	CZ 1 0.60 0.27) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceilii	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area 1.8	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.45 0.40 CZ 4 C & 5 0.027	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		
Skylights: Ceilings, adjacent to Exterior or Unconditioned Space Volumes: Attics:	Orientation: Same as Rated Unit ², by percenta Interior Shade Coefficient: Same as Energy Ratexternal Shading: None Climate Zone: 5 U-Value: SHGC: Class AW Assembly U-Factors (i.e., Structural Climate Zone: 5 Fixed Window U-Factor Operable Window U-Factor SHGC: None Construction Type: Wood frame Gross Area: Same as Rated Unit ² Insulation: 1, 3 Climate Zone: 5 Ceiling Assembly U-Factor: Construction Type: Vented with aperture = 1sc Radiant Barrier: In climate zones 1-3_5, if >10 I Construction Type: Composition shingle on wood	CZ 1 0.60 0.27) Windows b CZ 1 0.50 0.65 0.27 CZ 1 0.027	CZ 2 0.60 0.27 pased on 2 CZ 2 0.50 0.65 0.27 CZ 2 0.027 sq. ft. ceilii	CZ 3 0.35 0.30 012 IECC CZ 3 0.46 0.60 0.30 CZ 3 0.027 ng area 1.8	CZ 4 0.32 0.40 CZ 4 0.38 0.45 0.40 CZ 4 0.027	CZ 4 C & 5 0.30 0.40 CZ 4 C & 5 0.38 0.45 0.45 0.40 CZ 4 C & 5 0.027	CZ 6 0.30 0.40 CZ 6 0.36 0.43 0.40	0.30 0.40 CZ 7 0.29 0.37 0.40	0.30 0.40 CZ 8 0.29 0.37 0.40		



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

	Exhibit 1: Expanded ENERG							/										
Internal	Same as Energy Rating Reference Hon																	
Mass:	Additional mass specifically designed as a Thermal Storage Element for the Rated Unit shall be excluded																	
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,	Refrigerator: 423 kWh per year																	
Fixtures & Internal	Dishwasher: 0.66 EF, Place Setting Cap								_									
Gains:	Ceiling Fan: 122 CFM per Watt; Quantity = Number of bedrooms + 1 when ceiling fans present in the Rated Unit; otherwise Quantity = 0																	
0	Clothes Washer and Dryer: Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC Std. 301																	
		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,																	
Heating	refrigerator, dishwasher, clothes washer, clothes dryer, and ceiling fans specified in this section Heating capacity shall be selected in accordance with ACCA Manual S based on loads calculated for the Reference Design in accordance with																	
Systems:																		
1		ACCA Manual J, Eighth Edition, ASHRAE Handbook of Fundamentals, or an equivalent computation procedure. For forced-air HVAC systems, degraded capacity from Grade III install shall be accounted for using same methodology applied to Energy Rating Reference Home																
	Fuel Type: Same as Rated Unit 2, 98																	
	Installation Quality: For forced-air HVAC																	
	System Type: Same as Rated Unit ² , ex																	
	modeled with air-source or ground-sour																	
	with ground-source heat pump in CZ 7 & 8 where Rated Unit is modeled with air-source or ground-source heat pump, electric strip heat or electric baseboard heat; applicable efficiency selected from below 109																	
	Climate Zone: 5	CZ 1	CZ 2	CZ 3	CZ 4	CZ 4C & 5	CZ 6	CZ 7	CZ 8									
	Gas Furn. AFUE:	80	80	80	90	90	90	90	90									
	Oil Furn. AFUE:	80	80	80	85	85	85	85	85									
	Gas Boiler AFUE:	80	80	80	85	85	85	85	85									
	Oil Boiler AFUE:	80	80	80	85	85	85	85	85									
	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	3.5	3.5									
	For non-electric warm-air furnaces and	non-electric bo	oilers, the E	lectric Auxilia	ry Energy sh	all be determine	d in accordance	e with the										
	methodology for the Energy Rating Refe																	
Cooling	Cooling capacity shall be selected in ac																	
Systems:	ACCA Manual J, Eighth Edition, ASHRA degraded capacity from Grade III install								systems,									
	Fuel Type: Same as Rated Unit ^{2, 98}	Strail De accou	inted for us	ang same me	inodology app	office to Effergy i	Rating Reference	е поше										
	, , , , , , , , , , , , , , , , , , ,	Systems Gra	de III airflo	w and watt dra	aw for AC's 8	& air-source hea	t numns, also G	Grade III re	f charge									
									Installation Quality: For forced-air HVAC systems, Grade III airflow and watt draw; for AC's & air-source heat pumps, also Grade III ref. charge System Type: Same as Rated Unit ² , except Reference Design shall be configured with air-source heat pump in CZ 1-6 where Rated Unit is									
	modeled with air-source or ground-source heat pump, electric strip heat, or electric baseboard heat; and Reference Design shall be configured																	
	modeled with all-source of ground-sour	ce heat pump,	electric str	ip heat, or ele	ctric baseboa	ird heat; and Re	ference Design	shall be c										
	with ground-source heat pump in CZ 7 8	& 8 where Rate	ed Unit is m	odeled with a					onfigured									
	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficiency	& 8 where Rate iency selected	ed Unit is m	nodeled with a v ¹¹⁴⁰	ir-source or g	round-source h	eat pump, elect	ric strip he	onfigured eat, or 									
	with ground-source heat pump in CZ 7 8 electric baseboard heat; applicable efficient Climate Zone: 5	& 8 where Rate liency selected CZ 1	ed Unit is m from below CZ 2	nodeled with a v ¹¹⁴⁰ CZ 3	ir-source or g	round-source h	eat pump, elect	ric strip he	onfigured eat, or CZ 8									
	with ground-source heat pump in CZ 7 8 electric baseboard heat; applicable efficience: Climate Zone: AC SEER:	& 8 where Rate ciency selected CZ 1 14.5	ed Unit is m from below CZ 2 14.5	odeled with a v 1140 CZ 3 14.5	ir-source or g 	round-source h	eat pump, elect CZ 6 13	cric strip he	onfigured eat, or CZ 8									
	with ground-source heat pump in CZ 7 8 electric baseboard heat; applicable efficience Climate Zone: 5 AC SEER: Air-Source Heat Pump SEER:	& 8 where Rate ciency selected CZ 1 14.5 14.5	ed Unit is m from below CZ 2 14.5 14.5	odeled with a v 1140 CZ 3 14.5 14.5	CZ 4 13 14.5	CZ 4 C & 5 13 14.5	eat pump, elect 	cric strip he CZ 7 13 n/a	onfigured eat, or CZ 8 13 n/a									
Coming	with ground-source heat pump in CZ 7 8 electric baseboard heat; applicable efficience Climate Zone: 5 AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER:	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a	ed Unit is m from below CZ 2 14.5 14.5 n/a	odeled with a v 1110 CZ 3 14.5 14.5 n/a	ir-source or g 	CZ 4 C & 5 13 14.5 n/a	eat pump, elect 	cric strip he CZ 7 13 n/a 16.1	onfigured eat, or CZ 8 13 n/a 16.1									
Service Water	with ground-source heat pump in CZ 7 & electric baseboard heat; applicable efficience Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy	& 8 where Rate stency selected CZ 1 14.5 14.5 n/a y Rating Refere	ed Unit is m from below CZ 2 14.5 14.5 n/a ence Home	CZ 3 14.5 14.5 n/a e, as defined b	CZ 4 13 14.5 n/a py ANSI / RES	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std.	eat pump, elect 	cric strip he CZ 7 13 n/a 16.1	onfigured eat, or CZ 8 13 n/a 16.1									
Water	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficience Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Referent the Lighting,	ed Unit is m from below CZ 2 14.5 14.5 n/a ence Home Appliances	CZ 3 14.5 14.5 n/a e, as defined be, Fixtures, & I	CZ 4 13 14.5 n/a py ANSI / RES	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std.	CZ 6 13 14.5 n/a -301, except for	cric strip he CZ 7 13 n/a 16.1	onfigured eat, or CZ 8 13 n/a 16.1									
	with ground-source heat pump in CZ 7 & electric baseboard heat; applicable efficience Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Referent the Lighting,	ed Unit is m from below CZ 2 14.5 14.5 n/a ence Home Appliances	CZ 3 14.5 14.5 n/a e, as defined be, Fixtures, & I	CZ 4 13 14.5 n/a py ANSI / RES	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std.	CZ 6 13 14.5 n/a -301, except for	cric strip he CZ 7 13 n/a 16.1	onfigured eat, or CZ 8 13 n/a 16.1									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Ra	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Referent the Lighting,	ed Unit is m from below CZ 2 14.5 14.5 n/a ence Home Appliances	CZ 3 14.5 14.5 n/a e, as defined be, Fixtures, & I	CZ 4 13 14.5 n/a py ANSI / RES	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std.	CZ 6 13 14.5 n/a -301, except for	cric strip he CZ 7 13 n/a 16.1	onfigured eat, or CZ 8 13 n/a 16.1									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rank Type: Same as Rated Unit 2,98 System Type: Conventional storage war	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Reference ating Reference ter heater with	rom below CZ 2 14.5 14.5 1/a ence Home Appliances Home, as	CZ 3 14.5 14.5 n/a e, as defined by A defined by A	CZ 4 13 14.5 n/a py ANSI / RES nternal Gains NSI / RESNE	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301	CZ 6 13 14.5 n/a -301, except for	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficience Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Reserved Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.98 System Type: Conventional storage was instantaneous water heater in which case	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Reference ating Reference ter heater with se select 50 ga	rosolar he	CZ 3 14.5 14.5 n/a e, as defined by A defined by A	CZ 4 13 14.5 n/a py ANSI / RES nternal Gains NSI / RESNE	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301	CZ 6 13 14.5 n/a -301, except for	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Reference Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.98 System Type: Conventional storage was instantaneous water heater in which cas efficiency from below using tank size of	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Reference ating Reference ter heater with se select 50 ga	rosolar he	CZ 3 14.5 14.5 n/a e, as defined be continued by A	CZ 4 13 14.5 n/a py ANSI / RES nternal Gains NSI / RESNE	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficiency from below using tank size of Gas Storage Tank Capacity:	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Reference ating Reference ter heater with se select 50 ga	rosolar he	CZ 3 14.5 14.5 14.5 n/a s, as defined b s, Fixtures, & I defined by A eating, with tau r gas systems ≤ 55 Gal	CZ 4 13 14.5 n/a py ANSI / RES nternal Gains NSI / RESNE	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficience Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Recirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.98 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF:	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Reference ating Reference ter heater with se select 50 ga	rosolar he	CZ 3 14.5 14.5 n/a e, as defined be continued by A	CZ 4 13 14.5 n/a py ANSI / RES nternal Gains NSI / RESNE	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating	with ground-source heat pump in CZ 7 of electric baseboard heat; applicable efficiency from below using tank size of Gas Storage Tank Capacity:	& 8 where Rate ciency selected CZ 1 14.5 14.5 n/a y Rating Reference ating Reference ter heater with se select 50 ga	rosolar he	CZ 3 14.5 14.5 14.5 n/a s, as defined b s, Fixtures, & I defined by A ceating, with tair gas systems ≤ 55 Gal 0.67 EF	CZ 4 13 14.5 n/a py ANSI / RES nternal Gains NSI / RESNE	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Reference Energy Reference Same as Energy Reference Same as Rated Unit 2.98 System Type: Same as Rated Unit 2.98 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: 1342	& 8 where Rate ciency selected CZ 1 14.5 14.5 1/2 y Rating Reference ter heater with se select 50 ga Reference Des	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he sign	CZ 3 14.5 14.5 14.5 n/a e, as defined by A eating, with tai or gas systems ≤ 55 Gal 0.67 EF All Sizes 0.95 EF 40 Gallon	CZ 4 13 14.5 n/a by ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301 to that of Rated on tank for electrons.	CZ 6 13 14.5 n/a -301, except for Unit, unless Raric systems. Sel > 55 Gal 0.77 EF	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems:	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: With applicable efficiency from below using tank size of Gas Storage Tank Capacity: Electric Storage Tank Capacity: 1342 Oil DHW EF:	& 8 where Rate ciency selected CZ 1 14.5 14.5 1/4.5 1	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he allon tank for sign O Gallon 0.64	CZ 3 14.5 14.5 14.5 14.5 n/a e, as defined be, Fixtures, & I defined by A eating, with tar gas systems ≤ 55 Gal 0.67 EF All Sizes 0.95 EF 40 Gallon 0.62	CZ 4 13 14.5 n/a ny ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 50 Gallon 0.60	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301 to that of Rated on tank for electron 0.58	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel > 55 Gal 0.77 EF	CZ 7 13 n/a 16.1 r reduced u	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems:	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rescirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.98 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: 1342 Oil DHW EF: Duct Leakage to Outside: The greater of	& 8 where Rate ciency selected CZ 1 14.5 14.5 1/4.5 1	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he allon tank for sign CG 2 14.5 14.5 0 Gallon 0.64 100 sq. ft.	CZ 3 14.5 14.5 14.5 14.5 14.6 15, Fixtures, & I 16 defined by A cating, with tar 17 gas systems 18 40 Gallon 18 62 19 62 10 conditioned	CZ 4 13 14.5 n/a by ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 60 Gallon 0.60 d floor area o	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. Section ¹²⁴⁺ T / ICC Std. 301 to that of Rated on tank for electron 128 60 Gallon 0.58 r ≤ 40 CFM25	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel > 55 Gal 0.77 EF 70 Gallon 0.56	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems: Thermal Distribution	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rescirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.38 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: 1342 Oil DHW EF: Duct Leakage to Outside: The greater of Duct Insulation: • R-8 on supply ducts In	& 8 where Rate ciency selected CZ 1 14.5 14.5 14.5 n/a y Rating Reference ter heater with see select 50 ga Reference Dec	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he allon tank for sign CG 2 14.5 14.5 0 Gallon 0.64 100 sq. ft.	CZ 3 14.5 14.5 14.5 14.5 14.6 15, Fixtures, & I 16 defined by A cating, with tar 17 gas systems 18 40 Gallon 18 62 19 62 10 conditioned	CZ 4 13 14.5 n/a by ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 60 Gallon 0.60 d floor area o	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. S Section 1244 T / ICC Std. 301 to that of Rated on tank for electron 0.58	CZ 6 13 14.5 n/a -301, except for Unit, unless Raic systems. Sel > 55 Gal 0.77 EF 70 Gallon 0.56	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems:	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rescirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.98 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: 1342 Oil DHW EF: Duct Leakage to Outside: The greater of Duct Insulation: R-8 on supply ducts In Duct Surface Area: Same as Rated Unit	& 8 where Rate ciency selected CZ 1 14.5 14.5 14.5 n/a y Rating Reference ter heater with see select 50 ga Reference December 1 30 of 4 CFM25 per ocated in unco	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he sign Callon 0.64 100 sq. ft. nditioned a	CZ 3 14.5 14.5 14.5 14.5 n/a e, as defined by A eating, with tailor gas systems ≤ 55 Gal 0.67 EF All Sizes 0.95 EF 40 Gallon 0.62 of conditionedttic	CZ 4 13 14.5 n/a 19 ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 0.60 d floor area o	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. Section 1244 T / ICC Std. 301 to that of Rated on tank for electron 1.58 r ≤ 40 CFM25 her ducts locate	CZ 6 13 14.5 n/a -301, except for Unit, unless Raric systems. Sel > 55 Gal 0.77 EF 70 Gallon 0.56 d in uncondition	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica 80 Ga 0.5	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems: Thermal Distribution	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: **Colored Leaf Pump SEER:** **Air-Source Heat Pump SEER:** **Ground-Source Heat Pump EER:** **Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rescirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.98 **System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: **Gas DHW EF:** **Dil Storage Tank Capacity: 1342 **Oil DHW EF:** **Duct Leakage to Outside: The greater of Duct Insulation: • R-8 on supply ducts in Duct Surface Area: Same as Rated Unit Supply and Return Duct Locations shall	& 8 where Rate iency selected CZ 1 14.5 14.5 14.5 n/a y Rating Reference ter heater with see select 50 ga Reference Des 30 f 4 CFM25 per ocated in unco t 2 be configured	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he allon tank for sign O Gallon 0.64 100 sq. ft. nditioned a	CZ 3 14.5 14.5 14.5 14.5 n/a e, as defined be, Fixtures, & I defined by A eating, with tai or gas systems ≤ 55 Gal 0.67 EF All Sizes 0.95 EF 40 Gallon 0.62 of conditioned ttic to the number	CZ 4 13 14.5 n/a 19 ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 0.60 d floor area o	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. Section 1244 T / ICC Std. 301 to that of Rated on tank for electron 1.58 r ≤ 40 CFM25 her ducts locate ceiling type of the	eat pump, elect CZ 6 13 14.5 n/a -301, except for Unit, unless Raric systems. Sel > 55 Gal 0.77 EF 70 Gallon 0.56 d in uncondition Rated Unit us	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica 80 Ga 0.5 ned space	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems: Thermal Distribution	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rescirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.38 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: 1342 Oil DHW EF: Duct Leakage to Outside: The greater of Duct Insulation: Duct Surface Area: Same as Rated Unit Supply and Return Duct Locations shall Ceiling Type:	& 8 where Rate iency selected CZ 1 14.5 14.5 14.5 n/a y Rating Reference ter heater with see select 50 ga Reference December 1 30 f 4 CFM25 per ocated in unco t 2 be configured 100% Ac	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he allon tank for sign Callon 0.64 100 sq. ft. nditioned a according diabatic C	CZ 3 14.5 14.5 14.5 14.5 14.6 1, as defined by A eating, with tai or gas systems ≤ 55 Gal 0.67 EF All Sizes 0.95 EF 40 Gallon 0.62 of conditioned ttic to the number	CZ 4 13 14.5 n/a 19 ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 60 d floor area of R-6 on all of	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. Section 1244 T / ICC Std. 301 to that of Rated on tank for electron tank for electron 0.58 r ≤ 40 CFM25 her ducts locate ceiling type of the All Other	CZ 6 13 14.5 n/a -301, except for Unit, unless Raric systems. Sel > 55 Gal 0.77 EF 70 Gallon 0.56 d in uncondition Rated Unit user Ceiling Com	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica 80 Ga 0.5 ned space	onfigured eat, or CZ 8 13 n/a 16.1 usage									
Water Heating Systems: Thermal Distribution	with ground-source heat pump in CZ 7 a electric baseboard heat; applicable efficience Climate Zone: AC SEER: Air-Source Heat Pump SEER: Ground-Source Heat Pump EER: Use (Gallons per Day): Same as Energy resulting from the equipment specified in Tank Temperature: Same as Energy Rescirculation Pump: 0 kWh per year Fuel Type: Same as Rated Unit 2.38 System Type: Conventional storage was instantaneous water heater in which case efficiency from below using tank size of Gas Storage Tank Capacity: Gas DHW EF: Electric Storage Tank Capacity: Electric DHW EF: Oil Storage Tank Capacity: 1342 Oil DHW EF: Duct Leakage to Outside: The greater of Duct Insulation: • R-8 on supply ducts In Duct Surface Area: Same as Rated Unit Supply and Return Duct Locations shall Ceiling Type: One Story Unit: 100% of	& 8 where Rate ciency selected CZ 1 14.5 14.5 14.5 n/a y Rating Reference ter heater with see select 50 ga Reference December 1 30 f 4 CFM25 per ocated in unco t 2 be configured 100% Ac Supply & Retu	rom below CZ 2 14.5 14.5 14.5 n/a ence Home Appliances a Home, as no solar he allon tank for sign Callon 0.64 100 sq. ft. nditioned a according diabatic Curn Ducts in	CZ 3 14.5 14.5 14.5 14.5 14.5 14.6 15, Fixtures, & I 16 defined by A cating, with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A cating with tall or gas systems 1 defined by A	CZ 4 13 14.5 n/a 19 ANSI / RES nternal Gains NSI / RESNE nk size equal s and 60 gallo 60 d floor area of R-6 on all of	CZ 4 C & 5 13 14.5 n/a SNET / ICC Std. Section 12*+ T / ICC Std. 301 to that of Rated on tank for electron 1.58 r ≤ 40 CFM25 her ducts locate ceiling type of the 100% of Supplements 1.50	CZ 6 13 14.5 n/a -301, except for Unit, unless Raric systems. Sel > 55 Gal 0.77 EF 70 Gallon 0.56 d in uncondition Rated Unit user Ceiling Com y & Return Duc	CZ 7 13 n/a 16.1 r reduced u ated Unit u lect applica 80 Ga 0.5 ned space sing the ta	configured eat, or CZ 8 13 n/a 16.1 usage Uses Uses									
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ENERGY STAR Multifamily New Construction, Version 1 (Rev. 032)

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

Thermostat:	Type: Programmable										
	Temperature Setpoints: Same as Energy Rating Reference Home, but with offsets for a programmable thermostat, as defined by ANSI / RESNET / ICC Std301										
Infiltration &											
Mechanical	Floor Type:	100% Conditioned Space Below Rated Unit All Other Floor Combinations									
Ventilation:	cfm50/ft² Enclosure Area 1413	0.255 0.30									
	Mechanical ventilation system without heat recovery										
	Rate: CFM = 0.01 * CFA + 7.5 * (Nbr + 1), where CFA = Conditioned Floor Area and Nbr = Number of Bedrooms; Runtime: 24 Hours / Day										
	Fan Watts: Watts = CFM Rate / 2.2 CFM per Watt, where CFM Rate is determined above										
	Climate Zone: 5	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		

Revised 0912/2201/20220



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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, unless explicitly stated, such as vented attics where unvented attics are present in the Rated Unit or when needed to locate ducts. Where the envelope component is adiabatic in the Rated Unit, it shall also be adiabatic in the Multifamily Reference Design. Where the envelope component is not adiabatic but is adjacent to a space other than those specified in the Building Component column of Exhibit 1, model as uninsulated in the 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.
- 2009 IECC Climate Zone designations, as defined and illustrated in Section 301 of the code, shall be used to configure the ENERGY STAR Reference Design in National Version 1.
- 5.6. Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion.
- 6.7. 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.
- 7.8. A vented unconditioned attic shall only be modeled in the Multifamily Reference Design where attics (of any type) exist in the Rated Unit or when specified as the Duct Location in the Thermal Distribution Systems section of this Exhibit. Where the Rated Unit has more than one ceiling type, the ceiling area used to calculate the vent aperture area shall be the area of the ceiling that is exposed to exterior, under attics, and/or under other unconditioned common spaces. Where the Rated Unit is entirely located beneath another dwelling unit or conditioned common space, no attic is modeled in the Reference Design.
- 8.9. 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.
- 9-10. 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 Multifamily Reference Design shall be configured with a 7.7 HSPF air-source heat pump.
- 40.11. For a Rated Unit without a cooling system, the ENERGY STAR Multifamily Reference Design shall be configured with a 13 SEER electric air conditioner.
- 41.12. 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.
- 12.13. 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).
- 43.14. In accordance with the RESNET Guidelines for Multifamily Energy Ratings, for a Rated Unit with conditioned space below, 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. 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.