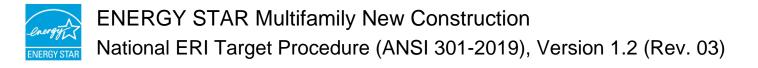
# ENERGY STAR<sup>®</sup> Residential New Construction Programs

## **Historical Document**

This document is provided for reference because it has been superseded by a more recent Version or Revision. Please find current program documents on the <u>Program</u> <u>Requirements</u> webpage.

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

For questions or more information, contact us at <u>energystarhome@energystar.gov</u>.



### National ERI Target Procedure for use with ANSI/RESNET/ICC 301-2019

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

An EPA-recognized Home Certification Organization's (HCO) 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 301-2019 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. RESNET interpretations of Standard 301-2019 shall also be followed. Any exceptions shall be approved by EPA and reported at <a href="https://www.energystar.gov/ERIExceptions">www.energystar.gov/ERIExceptions</a>. This value, rounded to the nearest whole number, shall equal the ENERGY STAR ERI Target.

The National ERI Target Procedure (ANSI 301-2014) must instead be used to determine the ENERGY STAR ERI Target when using ANSI / RESNET / ICC 301-2014.



#### Exhibit 1: Expanded ENERGY STAR Multifamily Reference Design Definition

| Building<br>Component   | omponent Expanded ENERGY STAR Multifamily Reference Design Definition <sup>1</sup>  |  |   |  |   |  |  |   |  |  |  |
|---|---|--|---|--|---|--|--|---|--|--|--|
| Foundations:  | Construction Type & Structural Mass: Same as Rated Unit <sup>2</sup> , 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 <sup>2</sup> , except:  |  |   |  |   |  |  |   |  |  |  |
|   | Crawlspaces shall be modeled as vented with net free vent aperture = 1sq. ft. per 150 sq. ft. of crawlspace floor area  |  |   |  |   |  |  |   |  |  |  |
|   | Gross Area: Same as Rated Unit <sup>2</sup>   |  |   |  |   |  |  |   |  |  |  |
|   | <ul> <li>Insulation: <sup>3,4</sup> Choose appropriate insulation level below;</li> <li>Basement Wall Continuous Insulation R-Value only applies to conditioned basements; if applicable, insulation shall be located on interior</li> </ul>  |  |   |  |   |  |  |   |  |  |  |
|   | side of walls <ul> <li>Floor assemblies above crawlspace for</li> </ul>   | oundations shal  | l be confia   | ured to me   | et the applic   | able floor assembly l  | U-factor liste   | ed in the bui   | Idina  |  |  |
|   | component section for Floors Over Ur  | nconditioned Sp  | aces and  | crawlspace   | e walls shall b   | be uninsulated   |  |   | Ū  |  |  |
|   | • 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  |  |   |  |   | ·····  |  |   |  |  |  |
|   | Climate Zone: <sup>6</sup>  | CZ 1   | <b>CZ 2</b>   | CZ 3   | <b>CZ 4</b><br>10   | <b>CZ 4 C &amp; 5</b><br>10  | CZ 6   | CZ 7  | CZ 8   |  |  |
|   | Slab Insulation R-Value:<br>Slab Insulation Depth (ft):   | 0<br>0   | 0   | 10<br>2  | 4   | 4  | 10<br>4  | 10<br>4   | 10<br>4  |  |  |
|   | Basement Wall Assembly U-Factor:  | 0.360  | 0.360   | 0.091  | 0.059   | 0.050  | 0.050  | 0.050   | 0.050  |  |  |
| loors Over  | Construction Type: Wood frame   |  |   |  |   |  |  |   |  |  |  |
| Inconditioned   | Gross Area: Same as Rated Unit <sup>2</sup>   |  |   |  |   |  |  |   |  |  |  |
| Space   | Insulation: <sup>3, 4</sup>   |  |   |  |   |  |  |   |  |  |  |
| /olumes,  | Climate Zone: 6   | CZ 1   | CZ 2  | CZ 3   | CZ 4  | CZ 4 C & 5   | CZ 6   | CZ 7  | CZ 8   |  |  |
| Ion-Freezing<br>Space or  | Wood Framed Floor U-Factor:   | 0.064  | 0.064   | 0.047  | 0.047   | 0.033  | 0.033  | 0.028   | 0.028  |  |  |
| outdoor<br>environment:   | Mass Floor U-Factor:  | 0.322  | 0.087   | 0.074  | 0.051   | 0.051  | 0.051  | 0.042   | 0.038  |  |  |
| bove-Grade  | Interior and Exterior Construction Type: Wo   | ood frame  |   |  |   |  |  |   |  |  |  |
| Valls,  | Gross Area: Same as Rated Unit <sup>2</sup>   |  |   |  |   |  |  |   |  |  |  |
| adjacent to<br>Exterior or  | Solar Absorptance = 0.75  |  |   |  |   |  |  |   |  |  |  |
|   | Emittance = 0.90  |  |   |  |   |  |  |   |  |  |  |
| Garage:   | Insulation: <sup>1, 3</sup>   |  |   |  |   |  |  |   |  |  |  |
| Jalaye.   |   | <b></b>  |   |  |   | C7 / C 2 6   | CZ 6   | CZ 7  | CZ 8   |  |  |
| Jaraye.   | Climate Zone: 6   | CZ 1   | CZ 2  | CZ 3   | CZ 4  | CZ 4 C & 5   |  |   |  |  |  |
| hermally  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:   | <b>CZ 1</b><br>0.084   | <b>CZ 2</b><br>0.084  | <b>CZ 3</b><br>0.060   | 0.045   | 0.045  | 0.045  | 0.045   | 0.045  |  |  |
| Thermally<br>Isolated<br>Sunrooms:  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE   | 0.084<br>properly install  | 0.084<br>ed to minir  | 0.060  | 0.045   | 0.045  | 0.045  | 0.045   | 0.045  |  |  |
| Thermally<br>Isolated<br>Sunrooms:  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup>   | 0.084<br>properly install<br>SNET / ICC 38   | 0.084<br>ed to minir<br>0   | 0.060<br>nize air lea  | 0.045<br>kage betwee  | 0.045<br>on the door and door  | 0.045<br>frame, to av  | 0.045<br>void the 140   | 0.045<br>0 CFM50   |  |  |
| Thermally<br>solated<br>Sunrooms:   | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:   | 0.084<br>properly install<br>SNET / ICC 38<br>Opaque   | 0.084<br>ed to minir<br>0   | 0.060<br>nize air lea<br>≤ 1,  | 0.045<br>kage betwee<br>/2-Lite   | 0.045<br>on the door and door<br>> 1/2-Lite CZ   | 0.045<br>frame, to av  | 0.045<br>roid the 140   | 0.045<br>0 CFM50   |  |  |
| hermally<br>solated<br>Sunrooms:  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:  | 0.084<br>properly install<br>SNET / ICC 38<br><b>Opaque</b><br>0.17  | 0.084<br>ed to minir<br>0   | 0.060<br>nize air lea<br>≤ 1,  | 0.045<br>kage betwee<br>/2-Lite<br>0.25   | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30   | 0.045<br>frame, to av  | 0.045<br>roid the 140<br>> 1/2-Lite (<br>0.30   | 0.045<br>0 CFM50   |  |  |
| Thermally<br>Isolated<br>Sunrooms:<br>Doors: <sup>7</sup><br>Glazing: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with   | 0.084<br>properly install<br>SNET / ICC 38<br>Opaque<br>0.17<br>n/a<br>out exceeding a   | 0.084<br>ed to minir<br>)   | 0.060<br>nize air lea<br>  | 0.045<br>kage betwee<br>/2-Lite   | 0.045<br>on the door and door<br>> 1/2-Lite CZ   | 0.045<br>frame, to av  | 0.045<br>roid the 140   | 0.045<br>0 CFM50   |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce  | 0.084<br>properly install<br>SNET / ICC 38<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area   | 0.084<br>ed to minir<br>o<br>available w  | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>vall area <sup>8</sup>  | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25   | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25   | 0.045<br>frame, to av  | 0.045<br>roid the 140<br>> 1/2-Lite (<br>0.30   | 0.045<br>0 CFM50   |  |  |
| Fhermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy  | 0.084<br>properly install<br>SNET / ICC 38<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area   | 0.084<br>ed to minir<br>o<br>available w  | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>vall area <sup>8</sup>  | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25   | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25   | 0.045<br>frame, to av  | 0.045<br>roid the 140<br>> 1/2-Lite (<br>0.30   | 0.045<br>0 CFM50   |  |  |
| Fhermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen  | 0.084<br>ed to minir<br>o<br>available w  | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>( | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>RESNET / ICC 301   | 0.045<br>frame, to av  | 0.045<br>void the 140<br>> 1/2-Lite (<br>0.30<br>0.40   | 0.045<br>0 CFM50<br>CZ 4-8   |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup>  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen  | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2   | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>(<br>vall area <sup>8</sup><br>, as defined<br>CZ 3                               | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5   | 0.045<br>frame, to av<br>1-3<br>CZ 6   | 0.045<br>void the 140<br>> 1/2-Lite (<br>0.30<br>0.40<br>CZ 7   | 0.045<br>0 CFM50<br>CZ 4-8   |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen  | 0.084<br>ed to minir<br>o<br>available w  | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>( | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>RESNET / ICC 301   | 0.045<br>frame, to av  | 0.045<br>void the 140<br>> 1/2-Lite (<br>0.30<br>0.40<br>CZ 7<br>0.27   | 0.045<br>0 CFM50<br>CZ 4-8   |  |  |
| Fhermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:  | 0.084<br>properly install<br>SNET / ICC 38<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25   | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>( | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27   | 0.045<br>void the 140<br>> 1/2-Lite (<br>0.30<br>0.40<br>CZ 7   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27   |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structure  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>wased on 2   | 0.060<br>nize air lea<br>≤ 1,<br>((<br>(all area <sup>8</sup> )<br>, as defined<br>CZ 3<br>0.30<br>0.25<br>021 IgCC          | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40   | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40                                 |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:  | 0.084<br>properly install<br>SNET / ICC 38<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25   | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>( | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27   | 0.045<br>void the 140<br>> 1/2-Lite (<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.27<br>0.40<br>CZ 7   | 0.045<br>0 CFM50<br>CZ 4-8<br>0.27<br>0.40<br>CZ 8                                 |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup>  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b<br>CZ 1   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>ased on 2<br>CZ 2  | 0.060<br>nize air lea<br>≤ 1,<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(<br>(                               | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6   | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40                                 |  |  |
| hermally<br>solated<br>sunrooms:<br>Doors: <sup>7</sup>   | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>Jral) Windows b<br>CZ 1<br>0.48   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>ased on 2<br>CZ 2<br>0.43  | 0.060<br>nize air lea<br>≤ 1,<br>((<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()                  | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>RESNET / ICC 301<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34                                   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40                         | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27                 |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup>  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:   | 0.084<br>properly install<br>SNET / ICC 380<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>Jral) Windows b<br>CZ 1<br>0.48<br>0.59   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>vased on 2<br>CZ 2<br>0.43<br>0.57   | 0.060<br>nize air lea<br>≤ 1,<br>((<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()                                    | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.34<br>0.43  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32                                 | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30         |  |  |
| Fhermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup><br>Glazing: <sup>7</sup><br>Skylights:   | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:  | 0.084<br>properly install<br>SNET / ICC 380<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>Jral) Windows b<br>CZ 1<br>0.48<br>0.59   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>vased on 2<br>CZ 2<br>0.43<br>0.57   | 0.060<br>nize air lea<br>≤ 1,<br>((<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()                                    | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.34<br>0.43  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40                         | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30         |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: 7<br>Glazing: 7<br>Glazing: 7<br>Skylights:<br>Ceilings,<br>idjacent to   | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup>  | 0.084<br>properly install<br>SNET / ICC 380<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>Jral) Windows b<br>CZ 1<br>0.48<br>0.59   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>vased on 2<br>CZ 2<br>0.43<br>0.57   | 0.060<br>nize air lea<br>≤ 1,<br>((<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()                                    | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.34<br>0.43  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40                         | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30         |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: 7<br>Glazing: 7<br>Glazing: 7<br>Skylights:<br>Ceilings,<br>dajacent to<br>Exterior or  | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup><br>Insulation: <sup>1, 3</sup>   | 0.084<br>properly install<br>SNET / ICC 380<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>Jral) Windows b<br>CZ 1<br>0.48<br>0.59   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>vased on 2<br>CZ 2<br>0.43<br>0.57   | 0.060<br>nize air lea<br>≤ 1,<br>((<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()                                    | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.34<br>0.43  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40                         | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30         |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: 7<br>Glazing: 7<br>Glazing: 7<br>Glazing: 7<br>Ceilings,<br>Idjacent to<br>Exterior or<br>Jnconditioned   | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup>  | 0.084<br>properly install<br>SNET / ICC 380<br>Opaque<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>Jral) Windows b<br>CZ 1<br>0.48<br>0.59   | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>vased on 2<br>CZ 2<br>0.43<br>0.57   | 0.060<br>nize air lea<br>≤ 1,<br>((<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()<br>()                                    | 0.045<br>kage betwee<br>/2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.34<br>0.43  | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43   | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40                         | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34   | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30         |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Ceilings,<br>adjacent to<br>Exterior or<br>Jnconditioned<br>Space<br>/olumes:            | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup><br>Insulation: <sup>1,3</sup><br>Climate Zone: <sup>6</sup><br>Ceiling Assembly U-Factor:  | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referent<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b<br>CZ 1<br>0.48<br>0.59<br>0.25<br>CZ 1<br>0.48<br>0.59<br>0.25                                | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>nased on 2<br>CZ 2<br>0.43<br>0.57<br>0.25<br>CZ 2<br>0.026                  | 0.060<br>nize air lea<br>≤ 1,<br>(0)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2                                  | 0.045<br>kage betwee<br>2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.43<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.40 | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>0.25<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43<br>0.40               | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40<br>0.40                 | 0.045<br>void the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.34<br>0.40                         | 0.045<br>0 CFM50<br>CZ 4-8<br>CZ 8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30<br>0.40 |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Ceilings,<br>adjacent to<br>Exterior or<br>Jnconditioned<br>Space<br>/olumes:            | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup><br>Insulation: <sup>1, 3</sup><br>Climate Zone: <sup>6</sup>   | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referent<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b<br>CZ 1<br>0.48<br>0.59<br>0.25<br>CZ 1<br>0.48<br>0.59<br>0.25                                | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>nased on 2<br>CZ 2<br>0.43<br>0.57<br>0.25<br>CZ 2<br>0.026                  | 0.060<br>nize air lea<br>≤ 1,<br>(0)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2                                  | 0.045<br>kage betwee<br>2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.43<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.40 | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>0.30<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.40 | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40<br>0.40<br>0.40<br>CZ 6 | 0.045<br>roid the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40 | 0.045<br>0 CFM50<br>CZ 4-8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30<br>0.40<br>CZ 8 |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Ceilings,<br>adjacent to<br>Exterior or<br>Jnconditioned<br>Space<br>/olumes:<br>Attics: | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup><br>Insulation: <sup>1,3</sup><br>Climate Zone: <sup>6</sup><br>Ceiling Assembly U-Factor:<br>Construction Type: Vented with aperture =   | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b<br>CZ 1<br>0.48<br>0.59<br>0.25<br>CZ 1<br>0.43<br>0.59<br>0.25<br>CZ 1<br>0.43<br>0.59<br>0.25 | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>nased on 2<br>CZ 2<br>0.43<br>0.57<br>0.25<br>CZ 2<br>0.026<br>sq. ft. ceili | 0.060<br>nize air lea<br>≤ 1,<br>(0)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2                                  | 0.045<br>kage betwee<br>2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.43<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.40 | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>0.30<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.40 | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40<br>0.40<br>0.40<br>CZ 6 | 0.045<br>roid the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40 | 0.045<br>0 CFM50<br>CZ 4-8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30<br>0.40<br>CZ 8 |  |  |
| Thermally<br>solated<br>Sunrooms:<br>Doors: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Glazing: <sup>7</sup><br>Ceilings,<br>adjacent to<br>Exterior or<br>Jnconditioned<br>Space<br>Volumes:<br>Attics: | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup><br>Insulation: <sup>1, 3</sup><br>Climate Zone: <sup>6</sup><br>Ceiling Assembly U-Factor:<br>Construction Type: Vented with aperture =<br>Radiant Barrier: None   | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b<br>CZ 1<br>0.48<br>0.59<br>0.25<br>CZ 1<br>0.43<br>0.59<br>0.25<br>CZ 1<br>0.43<br>0.59<br>0.25 | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>nased on 2<br>CZ 2<br>0.43<br>0.57<br>0.25<br>CZ 2<br>0.026<br>sq. ft. ceili | 0.060<br>nize air lea<br>≤ 1,<br>(0)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2                                  | 0.045<br>kage betwee<br>2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.43<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.40 | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>0.30<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.40 | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40<br>0.40<br>0.40<br>CZ 6 | 0.045<br>roid the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40 | 0.045<br>0 CFM50<br>CZ 4-8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30<br>0.40<br>CZ 8 |  |  |
| Thermally<br>Isolated<br>Sunrooms:<br>Doors: <sup>7</sup>   | Climate Zone: <sup>6</sup><br>Wall Assembly U-Factor:<br>None<br>Area: Same as Rated Unit <sup>2</sup> , with door seal<br>addition to measured airflow per ANSI / RE<br>Orientation: Same as Rated Unit <sup>2</sup><br>Door Type:<br>U-Factor:<br>SHGC:<br>Total Area: AG = 0.15 x CFA x FA x F, with<br>Orientation: Same as Rated Unit <sup>2</sup> , by perce<br>Interior Shade Coefficient: Same as Energy<br>External Shading: None<br>Climate Zone: <sup>6</sup><br>U-Factor:<br>SHGC:<br>Class AW Assembly U-Factors (i.e., Structu<br>Climate Zone: <sup>6</sup><br>Fixed Window U-Factor:<br>Operable Window U-Factor:<br>SHGC:<br>None<br>Construction Type: Wood frame<br>Gross Area: Same as Rated Unit <sup>2</sup><br>Insulation: <sup>1,3</sup><br>Climate Zone: <sup>6</sup><br>Ceiling Assembly U-Factor:<br>Construction Type: Vented with aperture =<br>Radiant Barrier: None<br>Construction Type: Composition shingle on | 0.084<br>properly install<br>SNET / ICC 380<br>0.17<br>n/a<br>out exceeding a<br>entage of area<br>/ Rating Referen<br>CZ 1<br>0.40<br>0.25<br>ural) Windows b<br>CZ 1<br>0.48<br>0.59<br>0.25<br>CZ 1<br>0.43<br>0.59<br>0.25<br>CZ 1<br>0.43<br>0.59<br>0.25 | 0.084<br>ed to minir<br>available w<br>nce Home<br>CZ 2<br>0.40<br>0.25<br>nased on 2<br>CZ 2<br>0.43<br>0.57<br>0.25<br>CZ 2<br>0.026<br>sq. ft. ceili | 0.060<br>nize air lea<br>≤ 1,<br>(0)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2)<br>(2                                  | 0.045<br>kage betwee<br>2-Lite<br>0.25<br>0.25<br>d by ANSI / F<br>CZ 4<br>0.30<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.43<br>0.40<br>CZ 4<br>0.34<br>0.43<br>0.40 | 0.045<br>In the door and door<br>> 1/2-Lite CZ<br>0.30<br>0.25<br>0.30<br>CZ 4 C & 5<br>0.27<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.43<br>0.40<br>CZ 4 C & 5<br>0.34<br>0.40 | 0.045<br>frame, to av<br>1-3<br>CZ 6<br>0.27<br>0.40<br>CZ 6<br>0.32<br>0.40<br>0.40<br>0.40<br>CZ 6 | 0.045<br>roid the 140<br>> 1/2-Lite 0<br>0.30<br>0.40<br>CZ 7<br>0.27<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40<br>CZ 7<br>0.28<br>0.34<br>0.40 | 0.045<br>0 CFM50<br>CZ 4-8<br>0.27<br>0.40<br>CZ 8<br>0.27<br>0.30<br>0.40<br>CZ 8 |  |  |



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

| Internal   | Same as Energy Rating Reference Home  | , as defined by  | / ANSI / RESN   | ET / ICC 301   |  |   |  |  |  |  |
|--|---|--|---|--|--|---|--|--|--|--|
| 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 100% for interior; 100% for exterior and garage  |  |   |  |  |   |  |  | garage   |  |
| Appliances,  | Refrigerator: 450 kWh per year  |  |   |  |  |   |  |  |  |  |
| Fixtures &<br>Internal   | Dishwasher: Capacity: Same as Rated Ur  |  |   |  |  | n Rated Unit  |  |  |  |  |
| Gains:   | For Standard capacity: LER = 270, GHWC  |  |   |  |  |   |  |  |  |  |
| Gains.   | For Compact capacity: LER = 203, GHWC = \$14.20, Elec\$ = \$0.12, Gas\$ = \$1.09, LCY = 208   |  |   |  |  |   |  |  |  |  |
|  | Ceiling Fan: 122 CFM per Watt; Quantity = Number of bedrooms + 1 when ceiling fans present in the Rated Unit; otherwise, Quantity = 0<br>Clothes Washer: If clothes washer present in the Rated Unit, efficiency equal to "Std 2018-Present" Standard Clothes Washer Model; otherwise   |  |   |  |  |   |  |  |  |  |
|  |   |  |   |  |  | sent" Standard  | Clothes Wa   | asher Mode   | ; otherwise  |  |
|  | same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC 301   |  |   |  |  |   |  |  |  |  |
|  | Clothes Dryer: Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC 301  |  |   |  |  |   |  |  |  |  |
|  | Water fixtures: all showers and faucets ≤ 2.0 gpm<br>Internal Gains: Same as Energy Rating Reference Home, as defined by ANSI / RESNET / ICC 301, except for adjustments for the lighting,  |  |   |  |  |   |  |  |  |  |
|  | refrigerator, dishwasher, clothes washer, a   |  |   |  | SNET / ICC   | SUT, except ic  | n aujustinei   |  | gnung,   |  |
| Heating  | Heating capacity shall be selected in acco  |  |   |  | ads calcula  | ted for the Ref   | erence Desi  | ian in accor   | dance with   |  |
| Systems:   | ACCA Manual J, Eighth Edition, ASHRAE   |  |   |  |  |   |  |  |  |  |
| eyeteme.   | degraded capacity from other-than-Grade   |  |   |  |  |   |  |  |  |  |
|  | Home. Where heat from a central boiler is   |  |   |  |  |   |  |  |  |  |
|  | the Rated Home in ANSI / RESNET / ICC   |  |   |  |  |   |  |  |  |  |
|  | heating systems: 1) a heat pump with a ca   |  | equal to the Re   | eference Des   | ign heating  | load divided b  | y 4.5 COP a  | and 2) a boil  | er with the  |  |
|  | balance of the capacity of (1-1/4.5) or 77.7  |  |   |  |  |   |  |  |  |  |
|  | Fuel Type: Same as Rated Unit, except R   |  |   |  |  |   |  |  |  |  |
|  | Installation Quality: For forced-air HVAC s   |  |   | er fan airflow   | deviation, C   | Grade II 0.52 V   | / / CFM blov   | wer fan effic  | iency, and   |  |
|  | for air-source heat pumps, Grade III refrig   |  |   | C  |  |   |  |  |  |  |
|  | System Type: Same as Rated Unit <sup>2</sup> , exce   |  |   | e configured   | with air-sou   | rce heat pump   | where Rate   | ed Unit has  | electric   |  |
|  | strip heat or electric baseboard heat; effici<br>Climate Zone: <sup>6</sup>   |  |   |  | CZ 4   | C7 4C 9 E   | C7.6   | 07.7   | <b>C7</b> 0  |  |
|  | Gas Furnace AFUE:   | CZ 1<br>80   | <b>CZ 2</b><br>80   | <b>CZ 3</b><br>80  | 90   | CZ 4C & 5<br>95   | <b>CZ 6</b><br>95  | <b>CZ 7</b><br>95  | <b>CZ 8</b><br>95  |  |
|  | Gas Boiler AFUE:  | 80<br>80   | 80  | 80   | 90<br>90   | 95<br>95  | 95<br>95   | 95<br>95   | 95<br>95   |  |
|  | Central Boiler, $\geq$ 300 KBtu/h E <sub>t</sub> :  | 80   | 80  | 80   | 86   | 95  | 95   | 95   | 95   |  |
|  | Central Boiler w/WLHP, ≥ 300 KBtu/h E   |  | 80  | 80   | 89   | 90  | 90   | 90   | 90   |  |
|  | Air-Source Heat Pump HSPF:  | 9.2  | 9.2   | 9.2  | 9.2  | 9.2   | 9.2  | 9.2  | 9.2  |  |
|  | Air-Source Heat Pump Backup:  | Electric   |   | Electric   | Electric   | Electric  | Electric   | Electric   | Electri  |  |
|  | Ground-Source Heat Pump COP:  | 2.7  | 2.7   | 2.7  | 2.7  | 2.7   | 2.7  | 2.7  | 2.7  |  |
|  | methodology for the Energy Rating Reference Home in ANSI / RESNET / ICC 301. For non-electric boilers and GSHPs, serving the Rated Uni<br>and other units through a shared circulation loop, the Electric Auxiliary Energy shall be determined in accordance with the methodology for the<br>Rated Home in ANSI / RESNET / ICC 301, using the same Shared Pump Power (SP <sub>kW</sub> ) OR using 0.85 for motor efficiency and using the same<br>HP as the pump serving the Rated Unit   |  |   |  |  |   |  |  |  |  |
|  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit  | , using the sa   | ectric Auxiliary<br>me Shared Pu  | Energy shall<br>mp Power (S  | be determi<br>P <sub>kW</sub> ) OR us  | ned in accorda<br>ing 0.85 for mo   | ance with the<br>otor efficience   | e methodolo<br>cy and using  | gy for the<br>the same   |  |
| Cooling  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco  | , using the sa   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S  | Energy shall<br>mp Power (S<br>based on los  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refe   | ance with the<br>otor efficience<br>erence Desi  | e methodolo<br>cy and using<br>gn in accord  | gy for the<br>the same<br>dance with   |  |
| •  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE   | , using the sa<br>rdance with A<br>Handbook of   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals  | Energy shall<br>mp Power (S<br>based on loa<br>, or an equiva  | be determi<br>iP <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refe<br>utation procedu  | ance with the<br>otor efficience<br>erence Desi<br>ure. For forc   | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVA  | gy for the<br>the same<br>dance with   |  |
| •  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh  | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using sa  | Energy shall<br>mp Power (S<br>based on loa<br>, or an equiva<br>ame methodo   | be determi<br>iP <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>plogy applie   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refu<br>tation procedu<br>d to Energy Ra   | ance with the<br>otor efficience<br>erence Desi<br>ure. For forc<br>ating Refere   | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVA(<br>ence Home  | gy for the<br>g the same<br>dance with<br>C systems  |  |
| •  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh<br>Fuel Type: Same as Rated Unit, except R   | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun<br>eference Desi  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using sa<br>gn shall be cor   | Energy shall<br>mp Power (S<br>based on loa<br>, or an equiva<br>ame methodo<br>nfigured with  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu<br>ology applie<br>gas where  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refu<br>atation procedu<br>to Energy Ra<br>Rated Unit has  | ance with the<br>otor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>anon-electric  | e methodolo<br>cy and using<br>gn in accoro<br>ed-air HVAO<br>ence Home<br>c equipmen  | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2, 10</sup>  |  |
| 0  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s  | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Grad  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using sa<br>gn shall be cor<br>e II -20% blows  | Energy shall<br>mp Power (S<br>based on loa<br>, or an equiva<br>ame methodo<br>nfigured with  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu<br>ology applie<br>gas where  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refu<br>atation procedu<br>to Energy Ra<br>Rated Unit has  | ance with the<br>otor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>anon-electric  | e methodolo<br>cy and using<br>gn in accoro<br>ed-air HVAO<br>ence Home<br>c equipmen  | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2, 10</sup>  |  |
| •  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade   | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Gradu<br>III refrigerant u  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>indercharge   | Energy shall<br>mp Power (S<br>based on loa<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow   | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where blogs<br>deviation, C   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refu<br>atation procedu<br>d to Energy Ra<br>Rated Unit has<br>Grade II 0.52 V   | ance with the<br>otor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>non-electric<br>V / CFM blox   | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVA0<br>ence Home<br>c equipmen<br>wer fan effic   | by for the same dance with C systems $t^{2, 10}$ iency and   |  |
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| •  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br><b>Climate Zone:</b> <sup>6</sup>  | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Grad<br>III refrigerant u<br>pt Reference<br>licable efficien   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>indercharge<br>Design shall be<br>cy selected fro   | Energy shall<br>mp Power (S<br>based on loa<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup>  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where b<br>deviation, C<br>with air-sou   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refu<br>tation procedu<br>d to Energy Ra<br>Rated Unit has<br>Grade II 0.52 W<br>rce heat pump   | ance with the<br>btor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>non-electric<br>/ / CFM blow   | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVAC<br>ence Home<br>c equipmen<br>wer fan effic<br>ed Unit has  | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2, 10</sup><br>iency and<br>electric   |  |
| 0  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:   | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Gradu<br>III refrigerant u<br>opt Reference<br>licable efficien<br><b>CZ 1</b><br>16  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blows<br>indercharge<br>Design shall bi<br>icy selected fro<br>CZ 2<br>16  | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>offigured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br>CZ 3<br>16  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy Ri<br>Rated Unit has<br>Grade II 0.52 W<br>rce heat pump<br>CZ 4 C & 5<br>14   | ance with the<br>boor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>a non-electrin<br>/ / CFM blow<br>where Rate<br>CZ 6<br>14   | e methodolo<br>cy and using<br>gn in accorr<br>ed-air HVAG<br>ence Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14  | by for the same dance with c systems t <sup>2,10</sup> iency and electric <b>CZ 8</b> 14   |  |
| 0  | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:   | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun<br>eference Desi<br>ystems, Grad<br>III refrigerant u<br>opt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>indercharge<br>Design shall be<br>cy selected fro<br><b>CZ 2</b><br>16<br>16<br>16<br>14  | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>16   | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>14   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy R<br>Rated Unit has<br>Grade II 0.52 V<br>rce heat pump<br>22 4 C & 5<br>14<br>16<br>14  | ance with the<br>botor efficience<br>erence Desi<br>irre. For forc<br>ating Refere<br>non-electric<br>V / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14   | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVAG<br>noce Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br><b>CZ 7</b><br>14<br>16<br>14   | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2,10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14   |  |
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| Systems:<br>Service<br>Vater                                   | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade I<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps and<br>kW/ton. For water-loop heat pumps, Refer<br>Use (Gallons per Day): Same as Energy F<br>from the dishwasher, low-flow fixtures, and   | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Grade<br>III refrigerant u<br>pt Reference<br>licable efficien<br>CZ 1<br>16<br>14<br>ower with wat<br>NSI / RESNET<br>I fans serving<br>rence Design S<br>Rating Referent  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>indercharge<br>Design shall be<br>cry selected fro<br>CZ 2<br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>ea</sub> shall be<br>for Home, as coner as specified  | Energy shall<br>mp Power (S<br>based on loc<br>, or an equiva-<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>14<br>mps, Refere<br>ing the same<br>. For chillers,<br>e determined<br>defined by AN<br>d in the Lighti  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>ology applie<br>gas where I<br>deviation, C<br>with air-sou<br><b>CZ 4</b> C<br>16<br>16<br>16<br>12<br>nce Design<br>pumping a<br>Reference<br>Using 15 E<br>NSI / RESNI<br>ing, Applian   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refu<br>tation procedu<br>d to Energy R<br>Rated Unit has<br>Grade II 0.52 V<br>rce heat pump<br><b>CZ 4 C &amp; 5</b><br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power (<br>Design SEER,<br>ER<br>ET / ICC 301, 6<br>ces, Fixtures 8   | ance with the<br>botor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>for non-electrin<br>// CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>16<br>14<br>De determinn<br>DR using 0.8<br>arg shall be de<br>except for reference  | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVAG<br>noce Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14<br>16<br>14<br>ed in accord<br>85 for motor<br>etermined u   | gy for the<br>g the sam<br>dance with<br>C systems<br>t <sup>2,10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>lance with<br>efficiency<br>sing 0.75<br>resulting  |  |
| Systems:<br>Service<br>Nater<br>Heating                        | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps anc<br>kW/ton. For water-loop heat pumps, Refer<br>Use (Gallons per Day): Same as Energy F<br>from the dishwasher, low-flow fixtures, and<br>Tank Temperature: Same as Energy Ratin   | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Grade<br>III refrigerant u<br>pt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wat<br>NSI / RESNE <sup>-</sup><br>I fans serving<br>rence Design S<br>Rating Reference  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>indercharge<br>Design shall be<br>icy selected fro<br>CZ 2<br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>ea</sub> shall be<br>ince Home, as defin  | Energy shall<br>mp Power (S<br>based on loc<br>, or an equiva-<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>14<br>imps, Refere<br>ing the same<br>. For chillers,<br>e determined<br>defined by ANSI /  | be determi<br>Pkw) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>pumping a<br>Reference<br>Using 15 E<br>NSI / RESNI<br>/ RESNET /   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy Ri<br>Rated Unit has<br>Grade II 0.52 W<br>rce heat pump<br><b>CZ 4 C &amp; 5</b><br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power (<br>Design SEER,<br>ER<br>ET / ICC 301, 6<br>ces, Fixtures 8<br>ICC 301   | ance with the<br>botor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>for non-electrin<br>// CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>16<br>14<br>De determinn<br>DR using 0.8<br>arg shall be de<br>except for reference  | e methodolo<br>cy and using<br>gn in accord<br>ed-air HVAG<br>noce Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14<br>16<br>14<br>ed in accord<br>85 for motor<br>etermined u   | gy for the<br>g the sam<br>dance with<br>C systems<br>t <sup>2,10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>lance with<br>efficiency<br>sing 0.75<br>resulting  |  |
| Systems:<br>Service<br>Nater<br>Heating                        | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sh<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps and<br>kW/ton. For water-loop heat pumps, Refer<br>Use (Gallons per Day): Same as Energy F<br>from the dishwasher, low-flow fixtures, and<br>Tank Temperature: Same as Energy Ratin<br>Recirculation Pump Energy (for pumps se  | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Grade<br>III refrigerant u<br>pt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wate<br>NSI / RESNET<br>I fans serving<br>rence Design S<br>Rating Reference<br>d clothes wash<br>ng Reference<br>rving the Rate   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blows<br>indercharge<br>Design shall be<br>cry selected fro<br>CZ 2<br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>eg</sub> shall bi<br>ce Home, as defir<br>d Unit and no   | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>16<br>14<br>mps, Refere<br>ing the same<br>. For chillers,<br><u>e</u> determined<br>defined by ANSI /<br>other units): (  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>pumping a<br>Reference<br>Usir J 5 E<br>USI / RESNI<br>(RESNET /<br>0 kWh per y  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy Ri<br>Rated Unit has<br>Grade II 0.52 W<br>rce heat pump<br><b>CZ 4 C &amp; 5</b><br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power (C<br>Design SEER,<br>ER<br>ET / ICC 301, e<br>ces, Fixtures 8<br>ICC 301<br>ear   | ance with the<br>botor efficience<br>erence Desi<br>ure. For forc<br>ating Refere<br>a non-electrin<br>/ / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>DR determinin<br>DR using 0.8<br>arg shall be d<br>except for re<br>& Internal Ga   | e methodolo<br>cy and using<br>gn in accorred-air HVAG<br>ence Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br><b>CZ 7</b><br>14<br>16<br>14<br>ed in accorre<br>35 for motor<br>etermined u<br>educed use<br>ains Section   | gy for the<br>g the sam<br>dance with<br>C systems<br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>16<br>14<br>sing 0.75<br>resulting   |  |
| Systems:<br>Service<br>Nater<br>Heating                        | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps, Refer<br>Use (Gallons per Day): Same as Energy F<br>from the dishwasher, low-flow fixtures, ani-<br>Tank Temperature: Same as Energy Ratin<br>Recirculation Pump Energy (for pumps se<br>Recirculation Pump Energy (for pumps se   | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun<br>eference Desid<br>ystems, Grad<br>III refrigerant u<br>spt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wat<br>NSI / RESNE<br>I fans serving<br>rence Design<br>Rating Reference<br>rving the Rate<br>rving the Rate  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blows<br>indercharge<br>Design shall be<br>cry selected fro<br>CZ 2<br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>eq</sub> shall bi<br>nee Home, as defin<br>d Unit and no<br>ed Unit and other   | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>offigured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>14<br>mps, Refere<br>For chillers,<br>e determined<br>defined by ANSI<br>d in the Lighti<br>ted by ANSI (<br>other units): (<br>er units): a c   | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>reference<br>I using 15 E<br>ISI / RESNI<br>ing, Applian<br>/ RESNET /<br>D kWh per y<br>defined by A  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy Ris<br>Rated Unit has<br>Grade II 0.52 W<br>rce heat pump<br><b>CZ 4 C &amp; 5</b><br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power O<br>Design SEER,<br>ER<br>ET / ICC 301, e<br>ces, Fixtures &<br>ICC 301<br>ear   | ance with the<br>botor efficience<br>erence Desi<br>irre. For forc<br>ating Refere<br>in non-electrin<br>/ / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>De determine<br>DR using 0.8<br>except for re<br>k Internal Ga  | e methodolo<br>cy and using<br>gn in accorred-air HVAG<br>ence Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14<br>16<br>14<br>ed in accorre<br>35 for motor<br>etermined u<br>educed use<br>ains Section  | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2, 10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>ance with<br>efficiency<br>sing 0.75<br>resulting<br>13   |  |
| Systems:<br>Service<br>Water<br>Heating                        | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps and<br>kW/ton. For water-loop heat pumps, Refet<br>Use (Gallons per Day): Same as Energy R<br>from the dishwasher, low-flow fixtures, and<br>Tank Temperature: Same as Energy Ratin<br>Recirculation Pump Energy (for pumps se<br>Recirculation Pump Energy (for pumps se<br>Shared HW Pump Power (SHWP <sub>kW</sub> ) OR to   | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun<br>eference Desi<br>ystems, Grad<br>UII refrigerant u<br>opt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wat<br>NSI / RESNE<br>I fans serving<br>rence Design a<br>Rating Reference<br>rying the Rate<br>rying the Rate<br>using 0.85 for the<br>state of the set of the set of the set of the set<br>using 0.85 for the set of the se  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blows<br>indercharge<br>Design shall be<br>cry selected fro<br><b>CZ 2</b><br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>eg</sub> shall bi<br>nee Home, as gecified<br>Home, as defin<br>d Unit and no<br>ind Unit and othe   | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>16<br>14<br>imps, Refere<br>ing the same<br>e determined<br>befined by ANSI<br>d in the Lighti<br>ted by ANSI<br>other units): (<br>er units): a c<br>y and using the  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>ology applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>pumping a<br>Reference<br>I using 15 E<br>ISI / RESNIT<br>/ RESNET /<br>D kWh per y<br>defined by A<br>he same HF  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy Ris<br>Rated Unit has<br>Grade II 0.52 W<br>rce heat pump<br><b>22 4 C &amp; 5</b><br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power (<br>Design SEER,<br>ER<br>ET / ICC 301, e<br>ces, Fixtures 8<br>ICC 301<br>rear<br>NSI / RESNE   | ance with the<br>botor efficience<br>erence Desi<br>irre. For forc<br>ating Refere<br>ron-electric<br>V / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>De determine<br>DR using 0.8<br>and shall be d<br>except for re<br>& Internal Ga<br>T / ICC 301,<br>serving the  | e methodolo<br>cy and using<br>gn in accorred-air HVAG<br>ence Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br><b>CZ 7</b><br>14<br>16<br>14<br>ed in accorred<br>35 for motor<br>etermined u<br>educed use<br>ains Section  | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2,10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>16<br>14<br>ance with<br>efficiency<br>sing 0.75<br>resulting<br>13  |  |
| Systems:<br>Service<br>Water<br>Heating                        | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps, Refer<br>Use (Gallons per Day): Same as Energy R<br>from the dishwasher, low-flow fixtures, and<br>Tank Temperature: Same as Energy Ratif<br>Recirculation Pump Energy (for pumps se<br>Shared HW Pump Power (SHWP <sub>kW</sub> ) OR u  | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun<br>eference Desi<br>ystems, Grad<br>UI refrigerant u<br>opt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wat<br>NSI / RESNET<br>I fans serving<br>rence Design<br>Rating Reference<br>rving the Rate<br>rving the Rate<br>using 0.85 for r   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>IN -20% blowe<br>Design shall be<br>coy selected fro<br>CZ 2<br>16<br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>ea</sub> shall be<br>ince Home, as defin<br>d Unit and no<br>id Unit and oth<br>motor efficiency<br>gn shall be con   | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>16<br>14<br>imps, Refere<br>ing the same<br>For chillers,<br>e determined<br>defined by ANSI/<br>other units): (<br>er units): as of<br>y and using the<br>figured with g  | be determi<br>Pkw) OR us<br>ads calculat<br>alent compu-<br>ology applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>pumping a<br>Reference<br>I using 15 E<br>NSI / RESNIT /<br>O kWh per y<br>defined by A<br>he same HF<br>gas where F  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy R<br>Rated Unit has<br>Grade II 0.52 V<br>rce heat pump<br>Z 4 C & 5<br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power O<br>Design SEER,<br>ER<br>ET / ICC 301, of<br>ces, Fixtures &<br>ICC 301<br>rear<br>NNSI / RESNE<br>Rater Unite has  | ance with the<br>botor efficience<br>erence Desi<br>irre. For forc<br>ating Refere<br>ron-electric<br>V / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>DR using 0.8<br>ang shall be d<br>except for re<br>& Internal Ga<br>T / ICC 301,<br>serving the<br>s non-electri   | e methodolo<br>cy and using<br>gn in accorred-air HVAG<br>ed-air HVAG<br>ed equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14<br>16<br>14<br>ed in accorre<br>35 for motor<br>etermined u<br>educed use<br>ains Section<br>, using the s<br><u>Rated Unit</u><br>c equipmen   | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2,10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>16<br>14<br>lance with<br>efficiency<br>sing 0.75<br>resulting<br>13<br>ame<br>t <sup>2,10</sup>                 |  |
| Systems:<br>Service<br>Water<br>Heating                        | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps, Grefer<br>Use (Gallons per Day): Same as Energy R<br>from the dishwasher, low-flow fixtures, and<br>Tank Temperature: Same as Energy Ratin<br>Recirculation Pump Energy (for pumps se<br>Shared HW Pump Power (SHWP <sub>kW</sub> ) OR u<br>Fuel Type: Same as Rated Unit except Re<br>System Type (when Rated Unit is served  | , using the sa<br>rdance with A<br>Handbook of<br>nall be accoun<br>eference Desi<br>ystems, Grad<br>III refrigerant (<br>opt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wate<br>NSI / RESNE<br>I fans serving<br>rence Design S<br>Rating Reference<br>rving the Rate<br>rving the Rate<br>sing 0.85 for r   | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>Indercharge<br>Design shall be<br>cy selected fro<br>CZ 2<br>16<br>16<br>16<br>14<br>er-loop heat pu<br>f / ICC 301, us<br>the Rated Unit<br>SEER <sub>ea</sub> shall be<br>ner as specified<br>Home, as defir<br>d Unit and no<br>id Unit and oth<br>motor efficiency<br>gn shall be con<br>ial system): Sa  | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>16<br>14<br>imps, Refere<br>ing the same<br>. For chillers,<br>e determined<br>defined by AN<br>d in the Lighti<br>ied by ANSI /<br>other units): (<br>er units): as of<br>y and using the<br>figured with of<br>ume as system   | be determi<br>Pkw) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>a Reference<br>I using 15 E<br>NSI / RESNIT<br>/ RESNET /<br>O kWh per y<br>defined by A<br>he same HF<br>gas where F<br>m serving th   | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy R<br>Rated Unit has<br>Grade II 0.52 V<br>rce heat pump<br>Z 4 C & 5<br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power O<br>Design SEER,<br>ER<br>ET / ICC 301, of<br>ces, Fixtures &<br>ICC 301<br>rear<br>NNSI / RESNE<br>Rater Unite has  | ance with the<br>botor efficience<br>erence Desi<br>irre. For forc<br>ating Refere<br>ron-electric<br>V / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>DR using 0.8<br>ang shall be d<br>except for re<br>& Internal Ga<br>T / ICC 301,<br>serving the<br>s non-electri   | e methodolo<br>cy and using<br>gn in accorred-air HVAG<br>ed-air HVAG<br>ed equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14<br>16<br>14<br>ed in accorre<br>35 for motor<br>etermined u<br>educed use<br>ains Section<br>, using the s<br><u>Rated Unit</u><br>c equipmen   | gy for the<br>g the same<br>dance with<br>C systems<br>t <sup>2,10</sup><br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>16<br>14<br>lance with<br>efficiency<br>sing 0.75<br>resulting<br>13<br>ame<br>t <sup>2,10</sup>                 |  |
| Cooling<br>Systems:<br>Service<br>Water<br>Heating<br>Systems: | Rated Home in ANSI / RESNET / ICC 301<br>HP as the pump serving the Rated Unit<br>Cooling capacity shall be selected in acco<br>ACCA Manual J, Eighth Edition, ASHRAE<br>degraded capacity from Grade III install sf<br>Fuel Type: Same as Rated Unit, except R<br>Installation Quality: For forced-air HVAC s<br>for AC's & air-source heat pumps, Grade<br>System Type: Same as Rated Unit <sup>2</sup> , exce<br>strip heat, or electric baseboard heat; app<br>Climate Zone: <sup>6</sup><br>AC SEER:<br>Air-Source Heat Pump SEER:<br>Ground-Source Heat Pump EER:<br>Where system type is a chiller or cooling t<br>the methodology for the Rated Home in A<br>and using the same HP as the pumps, Refei<br>Use (Gallons per Day): Same as Energy R<br>from the dishwasher, low-flow fixtures, and<br>Tank Temperature: Same as Energy Ratif<br>Recirculation Pump Energy (for pumps se<br>Recirculation Pump Energy (for pumps se<br>Shared HW Pump Power (SHWP <sub>kW</sub> ) OR u<br>Fuel Type: Same as Rated Unit except Re<br>System Type (when Rated Unit is served<br>fuel boilers or water heaters, use 90% E <sub>1</sub> .   | , using the sa<br>rdance with A<br>Handbook of<br>hall be accoun<br>eference Desi<br>ystems, Grad<br>III refrigerant us<br>opt Reference<br>licable efficien<br><b>CZ 1</b><br>16<br>16<br>14<br>ower with wate<br>NSI / RESNET<br>I fans serving<br>rence Design<br>Rating Reference<br>d clothes wast<br>ng Reference<br>rving the Rate<br>ising 0.85 for n<br>eference Design<br>by a commerce  | ectric Auxiliary<br>me Shared Pu<br>CCA Manual S<br>Fundamentals<br>ted for using si<br>gn shall be cor<br>e II -20% blowe<br>indercharge<br>Design shall be<br>cy selected fro<br><b>CZ 2</b><br>16<br>16<br>16<br>14<br>er-loop heat pu<br>T / ICC 301, us<br>the Rated Unit<br><u>SEERea shall be</u><br>coer as specified<br>Home, as defir<br>ed Unit and not<br>du Unit and not<br>du Unit and not<br>motor efficiency<br>gn shall be con<br>ial system): Sa<br>bilers or water h | Energy shall<br>mp Power (S<br>based on los<br>, or an equiva<br>ame methodo<br>figured with<br>er fan airflow<br>e configured<br>m below <sup>12</sup><br><b>CZ 3</b><br>16<br>16<br>16<br>14<br>umps, Refere<br>ing the same<br>. For chillers,<br>e determined<br>defined by AN<br>din the Lighti<br>ided by ANSI /<br>other units): a co<br>y and using the<br>figured with g<br>ime as systemeaters, use  | be determi<br>P <sub>kW</sub> ) OR us<br>ads calculat<br>alent compu-<br>blogy applie<br>gas where I<br>deviation, C<br>with air-sou<br>CZ 4 C<br>16<br>16<br>16<br>14<br>nce Design<br>a Reference<br>Using 15 E<br>VSI / RESNET /<br>D kWh per y<br>defined by A<br>he same HF<br>gas where F<br>m serving th<br>1.2 COP.  | ned in accorda<br>ing 0.85 for mo<br>ted for the Refutation procedu<br>d to Energy R:<br>Rated Unit has<br>Grade II 0.52 V<br>rce heat pump<br><b>22 4 C &amp; 5</b><br>14<br>16<br>14<br>SEER <sub>eq</sub> shall I<br>nd fan power (<br>Design SEER,<br>ER<br>ET / ICC 301, e<br>ces, Fixtures 8<br>ICC 301<br>rear<br>NNSI / RESNE<br>2 as the pump<br>Rater Unite has<br>ne Rated Unit,                           | ance with the<br>botor efficience<br>erence Desi<br>irre. For force<br>ating Refere<br>is non-electric<br>V / CFM blow<br>where Rate<br>CZ 6<br>14<br>16<br>14<br>00 determine<br>DR using 0.8<br>and shall be determine<br>DR using 0.8<br>internal Ga<br>Except for reference<br>k Internal Ga<br>T / ICC 301,<br>serving the<br>is non-electric<br>with no sola | e methodolo<br>cy and using<br>gn in accore<br>ed-air HVAG<br>nnce Home<br>c equipmen<br>wer fan effic<br>ed Unit has<br>CZ 7<br>14<br>16<br>14<br>ed in accore<br>35 for motor<br>etermined u<br>educed use<br>ains Section<br>, using the s<br><u>Rated Unit</u><br>c equipmen<br>r heating. F   | gy for the<br>g the same<br>dance with<br>C systems<br>$t^{2,10}$<br>iency and<br>electric<br><b>CZ 8</b><br>14<br>16<br>14<br>lance with<br>efficiency<br>sing 0.75<br>resulting<br>13<br>ame<br>$t^{2,10}$<br>or fossil-                             |  |
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## ENERGY STAR Multifamily New Construction National ERI Target Procedure (ANSI 301-2019), Version 1.2 (Rev. 03)

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

| Thermal                      | Duct Leakage to Outside: 0 CFM25 per 100 sq. ft. of conditioned floor area   |                         |              |                 |                |                    |               |                |             |  |
|------------------------------|--|-------------------------|--------------|-----------------|----------------|--------------------|---------------|----------------|-------------|--|
| Distribution                 | Duct Insulation: None  |                         |              |                 |                |                    |               |                |             |  |
| Systems:                     | Duct Surface Area: Same as   | Rated Unit <sup>2</sup> |              |                 |                |                    |               |                |             |  |
|                              | Supply and Return Duct Loca  | tions shall be 100%     | in condition | ed space        |                |                    |               |                |             |  |
| Dehumid-<br>ifiers           | Type, capacity, efficacy, and or<br>dehumidification system is pre-  |                         |              |                 | Reference H    | ome, as defined    | by ANSI / R   | ESNET / ICC    | 301, when   |  |
| Thermostat:                  | Type: Programmable   |                         |              |                 |                |                    |               |                |             |  |
|                              | Temperature Setpoints: Same<br>RESNET / ICC 301  | e as Energy Rating      | Reference H  | ome, but with   | offsets for a  | programmable t     | hermostat, a  | s defined by / | ANSI /      |  |
| Infiltration &<br>Mechanical | Compartmentalization Rates:<br>ICC 301   | 0.3 cfm50/ft2 Enclo     | sure Area, w | ith Aext applie | ed to calculat | e Infiltration Rat | e, in accorda | ance with ANS  | SI / RESNET |  |
| Ventilation:                 | 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 / 2.8 CFM per Watt, where CFM Rate is determined above   |                         |              |                 |                |                    |               |                |             |  |
|                              | Climate Zone: 6  | 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     |  |



#### 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. 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.
- 5. Note that, for the purposes of the ENERGY STAR Reference Design, the slab insulation R-value and depth shall be modeled even in jurisdictions designated by a code official as having Very Heavy Termite Infestation for the purpose of determining the ENERGY STAR ERI Target. This is in contrast to the total UA limit in support of Item 3.1 of the National Rater Design Review Checklist, which when calculated at a unit level shall be calculated by replacing the code-required slab insulation R-value and depth with the slab insulation R-value and depth specified in the Rated Unit for such jurisdictions.
- 6. 2021 IECC climate zones, as defined and illustrated in <u>Section R301</u> of the code, shall be used to configure the ENERGY STAR Reference Design. Note that some locations have shifted to a different climate zone in the 2021 IECC compared to prior editions.
- 7. Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion.
- 8. 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.
- 9. 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 unrated conditioned space, no attic is modeled in the Reference Design.
- 10. 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, unless otherwise specified by ANSI / RESNET / ICC 301.
- 11. 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. Where a furnace or boiler is the heating system for the Rated Unit and is rated in combustion efficiency (Ec), the thermal efficiency (Et) shall be modeled as Ec-2%. Where thermal efficiency (Et) is modeled, it shall be converted to AFUE using the following equation: Et = 0.875 x AFUE +10.5%.
- 12. For a Rated Unit without a cooling system, the ENERGY STAR Multifamily Reference Design shall be configured with a 13 SEER electric air conditioner.



### ENERGY STAR Multifamily New Construction National ERI Target Procedure (ANSI 301-2019), Version 1.2 (Rev. 03)

13. That is to say, representative of low-flow plumbing fixtures, reference or "Std 2018-Present" Standard Clothes Washer Model 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.